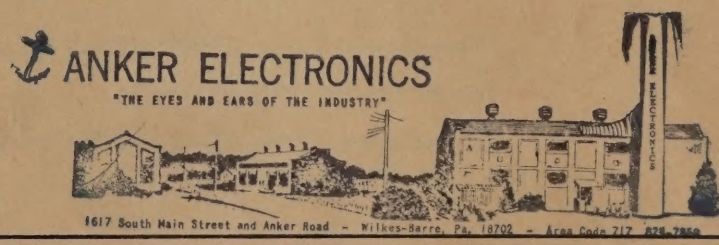
DEPARTMENT OF THE ARMY TECHNICAL MANUAL — TM 11-5820-287-10

DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER — TO 31R2-2TRC24-51

# OPERATOR'S MANUAL

# RADIO SETS AN/TRC-24, AN/GRC-75, AN/GRC-78, AND AN/GRC-81; RADIO TERMINAL SETS AN/TRC-35, AN/GRC-76, AN/GRC-79, AND AN/GRC-82; RADIO RELAY SET AN/TRC-36; RADIO REPEATER SETS AN/GRC-77, AN/GRC-80, AND AN/GRC-83; AND RADIO SET GROUP AN/TRA-25



ANKER ELECTRONICS
"THE EYES AND EARS OF THE INDUSTRY"
1617 South Main Street and Anker Road - Wilkes-Barre, Pa. 18702 - Area Code 717


*DEPARTMENTS OF THE ARMY AND THE AIR FORCE*

AGO 1675A

## WARNING

### HIGH VOLTAGE

is used in the operation
of this equipment.

### DEATH ON CONTACT

may result if operating
personnel fail to observe
safety precautions.

## DANGEROUS VOLTAGES ARE PRESENT AT THE FOLLOWING LOCATIONS:

| | |
|---|---|
| Transmitter, Radio T–302(*)/TRC | 750 volts direct current |
| Power Supply PP–685(*)/TRC | 900 volts direct current |
| Transformer, Power, Fixed Auto Transformer TF–167/TRC | 115 or 230 volts, 50 to 60 cycles |

*TM 11-5820-287-10/TO
TO 31R2-2TRC24-51

TECHNICAL MANUAL
No. 11-5820-287-10
TECHNICAL ORDER
No. 31R2-2TRC24-51

DEPARTMENTS OF THE ARMY
AND THE AIR FORCE

WASHINGTON 25, D. C., *19 September 1960*

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# RADIO SETS AN/TRC-24, AN/GRC-75, AN/GRC-78, AND AN/GRC-81; RADIO TERMINAL SETS AN/TRC-35, AN/GRC-76, AN/GRC-79, AND AN/GRC-82; RADIO RELAY SET AN/TRC-36; RADIO REPEATER SETS AN/GRC-77, AN/GRC-80, AND AN/GRC-83; AND RADIO SET GROUP AN/TRA-25


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*** This manual supersedes so much of TM 11-687, 14 September 1955, including C1, 23 May 1956, C2, 7 November 1956, C3, 21 February 1957, C4, 13 May 1958, C5, 7 November 1958, C6, 22 July 1959, and C7, 26 May 1960, as pertains to operating instructions and TM 11-5820-287-10P, 15 June 1959.**

# CHAPTER 1

# INTRODUCTION

## Section I. GENERAL

### 1. Scope

*a.* This manual describes Radio Sets AN/TRC–24, AN/GRC–75, AN/GRC–78, and AN/GRC–81; Radio Terminal Sets AN/TRC–35, AN/GRC–76, AN/GRC–79, and AN/GRC–82; Radio Relay Set AN/TRC–36, Radio Repeater Sets AN/GRC–77, AN/GRC–80, and AN/GRC–83, and Radio Set Group AN/TRA–25, and covers their operation and operator's maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of authorized parts for first echelon maintenance personnel.

*b.* All the radio equipment sets are similar, but differ in the type and quantity of components (par. 5).

(1) The difference in types of components is primarily related to the frequency band over which a particular set may be operated. The AN/TRC–24, AN/TRC–35, and AN/TRC–36 are equipped for B- and C-band operation; the AN/GRC–75, AN/GRC–76, and AN/GRC–77 for A-band operation; the AN/GRC–78, AN/GRC–79, and AN/GRC–80 for B- and D-band operation; and the AN/GRC–81, AN/GRC–82, and AN/GRC–83 for C-band operation. The AN/TRA–25 may be used with sets which contain B-band facilities to provide operation over the F-band.

(2) The difference in quantity of components is primarily related to the intended application of a set in a system (par. 3).

*c.* Official nomenclature followed by (*) is used to indicate all models of the equipment covered in this manual. The following chart indicates the various models that are indicated by a particular nomenclature.

| Nomenclature | Models |
|---|---|
| Transmitter Radio, T–302(*)/TRC. | Transmitter, Radio T–302/TRC and T–302A/TRC. |
| Receiver, Radio R–417(*)/TRC. | Receiver, Radio R–417/TRC and R–417A/TRC. |
| Power Supply PP–685(*)/TRC. | Power Supply PP–685/TRC and PP–685A/TRC. |
| Amplifier-Multiplier, Radio Frequency AM–915(*)/TRC. | Amplifier-Multiplier, Radio Frequency AN–915/TRC and AM–915A/TRC. |
| Radio Frequency Amplifier AM–912(*)/TRC. | Radio Frequency Amplifier AM–912/TRC and AM–912A/TRC. |

### 2. Forms and Records

*a. Unsatisfactory Equipment Reports.*

(1) Fill out and forward DD Form 787–1 (Electronics Failure Report—Signal Equipment (*in lieu of* DA Form 468, Unsatisfactory Equipment Report)), to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-MLM, Fort Monmouth, N. J., as prescribed in AR–700–38.

(2) Fill out and forward AF TO Form 29 (Unsatisfactory Report) to the Commander, Air Materiel Command, Wright-Patterson Air Force Base, Ohio, as prescribed in AF TO 00–35–D54.

*b. Report of Damaged or Improper Shipment.* Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700–58 (Army); Navy Shipping Guide, Article 1850–4 (Navy); and AFR 71–4 (Air Force).

*c. Preventive Maintenance Forms.* Prepare DA Form 11–238 (fig. 34 and 35) (Maintenance Check List for Signal Equipment (Sound Equipment, Radio, Direction Finding, Radar, Carrier, Radiosonde and Television)), in accordance with instructions on the form.

*d. Parts List Form.* Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8, and 9), directly to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: SIGMS-MLM, Fort Monmouth, N. J., with comments on parts listings in appendix II.

*e. Comments on Manual.* Forward all other

comments on this publication directly to the Commanding Officer, U. S. Army Signal Materiel Support Agency, ATTN: Pub Engrg, Dept. Fort Monmouth, N. J.

## Section II. DESCRIPTION AND DATA

### 3. Purpose and Use

*a.* The radio equipment sets covered in this manual (par. 1) provide the terminal and intermediate point (repeater) facilities for radio sections of multichannel communications systems using carrier equipment such as Telephone Terminals AN/TCC–7 (TM 11–2139–10, TM 11–2150). Other types of carrier telephone terminal equipment may be used if their technical characteristics permit (par. 4).

*b.* Radio sets, as differentiated from radio terminal sets and radio repeater (or relay) sets (for example, Radio Set AN/TRC–24), may be used at the terminal ends of a radio section, or they may be used in pairs at intermediate points in the section. However, in most cases, *radio sets* are combined with other equipments to form other nomenclature sets which are intended for specific use as terminal sets or as repeater (or relay) sets (par. 5). For example, Radio Terminal Set AN/TRC–35 includes all of the components of one Radio Set AN/TRC–24 plus additional equipment; this set is for use at the terminal ends of a radio section. Radio Relay Set AN/TRC–36 includes most of the components of two Radio Sets AN/TRC–24 plus additional equipment; this set is intended for use at intermediate points to extend the range of the section between terminals.

*c.* In some cases, most of the major components of one or more *radio sets* is used as a part of a shelter-housed radio terminal or repeater set. For example, Radio Terminal Set AN/MRC–69(V) (TM 11–5820–204–15) includes major components of two *radio sets;* Radio Repeater Set AN/MRC–54(V) (TM 11–5820–203–15) includes major components of three *radio sets.*

### 4. Technical Characteristics

*a. Transmitter, Radio T–302(*)/TRC.*

| | |
|---|---|
| Frequency range: | |
| Amplifier, Radio Frequency AM–1180/GRC (A-band): | |
| Frequency range | 50 to 100 mcs. |
| Number of channels | 200. |
| Channel separation | 0.25 mcs. |
| Amplifier, Radio Frequency AM–912(*)/TRC (B-band): | |
| Frequency range | 100 to 225 mcs. |
| Number of channels | 250. |
| Channel separation | 0.5 mcs. |
| Amplifier-Multiplier, Radio Frequency AM–915(*)/TRC (C-band): | |
| Frequency range | 225 to 400 mcs. |
| Number of channels | 175. |
| Channel separation | 1 mcs. |
| Amplifier-Multiplier, Radio Frequency AM–1178/GRC (D-band): | |
| Frequency range | 400 to 600 mcs. |
| Number of channels | 133. |
| Channel separation | 1.5 mcs. |
| Amplifier-Converter AM–2537/TRA–25 (F-band (*low*)): | |
| Frequency range | 790 to 915 mcs. |
| Number of channels | 250. |
| Channel separation | 0.05 mcs. |
| Amplifier-Converter AM–2537/TRA–25 (F-band (*high*)): | |
| Frequency range | 840 to 925 mcs. |
| Number of channels | 250. |
| Channel separation | 0.05 mcs. |
| Transmitter type | Reactance tube modulated oscillator. |
| Power output | 50 to 120 w. |
| Type of modulation | Fm. |
| Type of transmission | Voice and multichannel carrier. |
| Number of carrier channels | 12 max. |
| Base-band frequency range: | |
| Equipment bearing Order No. 39906–PP–58 | 250 to 108,000 cps. |
| All other equipments | 250 to 68,000 cps. |
| Voltage requirements: | |
| Filaments | 2.5 and 6.3 v, 50 to 60 cps. |
| Blower motors | 115 v, 50 to 60 cps. |
| B+ | 150, 250, and 750 vdc. |
| Input impedance | 135 or 600 ohms. |
| Output impedance | 52 ohms. |
| Transmission range (line of sight) | 30 mi approx. |
| Frequency stability | Crystal-controlled, afc circuits. |
| Number of tubes when used with: | |
| AM–912(*)/TRC or AM–1180/GRC | 26. |
| AM–915(*)/TRC or AM–1178/GRC | 27. |
| AM–2537/TRA–25 | 31. |

*b. Receiver, Radio R–417(*)/TRC.*

| | |
|---|---|
| Frequency range: | |
| Amplifier-Converter AM–1179/GRC (A-band) | 50 to 100 mcs. |
| Amplifier-Converter AM–913/TRC (B-band) | 100 to 225 mcs. |
| Amplifier-Converter AM–914/TRC (C-band) | 225 to 400 mcs. |

Amplifier-Converter AM–1177/GRC (D-band)---------- 400 to 600 mcs.
Amplifier-Converter AM–913/TRC with Mixer Stage, Frequency CV–932/TRA–25 (F-band)---------- 790 to 965 mcs.
Receiver type---------- Superheterodyne.
Type of reception---------- Frequency modulated carrier.

Base-band frequency range:
Equipment bearing Order No. 39906–PP–58---------- 250 to 108,000 cps.
All other equipments---------- 250 to 68,000 cps.
Input impedance---------- 52 ohms.
Output impedance---------- 135 or 600 ohms.
Intermediate frequency---------- 30 mcs.
Voltage requirements---------- 115 v, 50 to 60 cps, —12 vdc.
Power consumption---------- 185 w.
Order-wire signalling circuit frequency- 1,600 cps.
Number of tubes:
AM–1179/GRC---------- 31.
AM–913/TRC---------- 30.
AM–914/TRC---------- 33.
AM–1177/GRC---------- 32.
AM–913/TRC with CV–932/TRA–25---------- 31.
Frequency control---------- Afc.
Gain control---------- Agc- and manual-gain control.

*c. RF Channel Number Frequency Assignment for T–302(*)/TRC and R–417(*)/TRC.*

| RF channel No. | | A-band (50–100 mc) | B-band (100–225 mc) | C-band (225–400 mc) | D-band (400–600 mc) | F-band | |
|---|---|---|---|---|---|---|---|
| Odd | Even | | | | | Low (790–915 mc) | High (840–965 mc) |
| 1 | | 50.125 | 100.250 | | | 790.500 | 840.500 |
| | 2 | 50.375 | 100.750 | | | 791.000 | 841.000 |
| 3 | | 50.625 | 101.250 | | | 791.500 | 841.500 |
| | 4 | 50.875 | 101.750 | | | 792.000 | 842.000 |
| 5 | | 51.125 | 102.250 | | | 792.500 | 842.500 |
| | 6 | 51.375 | 102.750 | | | 793.000 | 843.000 |
| 7 | | 51.625 | 103.250 | | | 793.500 | 843.500 |
| | 8 | 51.875 | 103.750 | | | 794.000 | 844.000 |
| 9 | | 52.125 | 104.250 | | | 794.500 | 844.500 |
| | 10 | 52.375 | 104.750 | | | 795.000 | 845.000 |
| 11 | | 52.625 | 105.250 | | | 795.500 | 845.500 |
| | 12 | 52.875 | 105.750 | | | 796.000 | 846.000 |
| 13 | | 53.125 | 106.250 | | | 796.500 | 846.500 |
| | 14 | 53.375 | 106.750 | | | 797.000 | 847.000 |
| 15 | | 53.625 | 107.250 | | | 797.500 | 847.500 |
| | 16 | 53.875 | 107.750 | | | 798.000 | 848.000 |
| 17 | | 54.125 | 108.250 | | | 798.500 | 848.500 |
| | 18 | 54.375 | 108.750 | | | 799.000 | 849.000 |
| 19 | | 54.625 | 109.250 | | | 799.500 | 849.500 |
| | 20 | 54.875 | 109.750 | | | 800.000 | 850.000 |
| 21 | | 55.125 | 110.250 | | | 800.500 | 850.500 |
| | 22 | 55.375 | 110.750 | | | 801.000 | 851.000 |
| 23 | | 55.625 | 111.250 | | | 801.500 | 851.500 |
| | 24 | 55.875 | 111.750 | | | 802.000 | 852.000 |
| 25 | | 56.125 | 112.250 | | | 802.500 | 852.500 |
| | 26 | 56.375 | 112.750 | 225.500 | | 803.000 | 853.000 |
| 27 | | 56.625 | 113.250 | 226.500 | | 803.500 | 853.500 |
| | 28 | 56.875 | 113.750 | 227.500 | | 804.000 | 854.000 |
| 29 | | 57.125 | 114.250 | 228.500 | | 804.500 | 854.500 |
| | 30 | 57.375 | 114.750 | 229.500 | | 805.000 | 855.000 |
| 31 | | 57.625 | 115.250 | 230.500 | | 805.500 | 855.500 |
| | 32 | 57.875 | 115.750 | 231.500 | | 806.000 | 856.000 |
| 33 | | 58.125 | 116.250 | 232.500 | | 806.500 | 856.500 |
| | 34 | 58.375 | 116.750 | 233.500 | | 807.000 | 857.000 |
| 35 | | 58.625 | 117.250 | 234.500 | | 807.500 | 857.500 |
| | 36 | 58.875 | 117.750 | 235.500 | | 808.000 | 858.000 |
| 37 | | 59.125 | 118.250 | 236.500 | | 808.500 | 858.500 |
| | 38 | 59.375 | 118.750 | 237.500 | | 809.000 | 859.000 |
| 39 | | 59.625 | 119.250 | 238.500 | | 809.500 | 859.500 |
| | 40 | 59.875 | 119.750 | 239.500 | | 810.000 | 860.000 |

| RF channel No. | | A-band (50–100 mc) | B-band (100–225 mc) | C-band (225–400 mc) | D-band (400–600 mc) | F-band | |
|---|---|---|---|---|---|---|---|
| Odd | Even | | | | | Low (790–915 mc) | High (840–965 mc) |
| 41 | | 60.125 | 120.250 | 240.500 | | 810.500 | 860.500 |
| | 42 | 60.375 | 120.750 | 241.500 | | 811.000 | 861.000 |
| 43 | | 60.625 | 121.250 | 242.500 | | 811.500 | 851.500 |
| | 44 | 60.875 | 121.750 | 243.500 | | 812.000 | 862.000 |
| 45 | | 61.125 | 122.250 | 244.500 | | 812.500 | 862.500 |
| | 46 | 61.375 | 122.750 | 245.500 | | 813.000 | 863.000 |
| 47 | | 61.625 | 123.250 | 246.500 | | 813.500 | 863.500 |
| | 48 | 61.875 | 123.750 | 247.500 | | 814.000 | 864.000 |
| 49 | | 62.125 | 124.250 | 248.500 | | 814.500 | 864.500 |
| | 50 | 62.375 | 124.750 | 249.500 | | 815.000 | 865.000 |
| 51 | | 62.625 | 125.250 | 250.500 | | 815.500 | 865.500 |
| | 52 | 62.875 | 125.750 | 251.500 | | 816.000 | 866.000 |
| 53 | | 63.125 | 126.250 | 252.500 | | 816.500 | 866.500 |
| | 54 | 63.375 | 126.750 | 253.500 | | 817.000 | 867.000 |
| 55 | | 63.625 | 127.250 | 254.500 | | 817.500 | 867.500 |
| | 56 | 63.875 | 127.750 | 255.500 | | 818.000 | 868.000 |
| 57 | | 64.125 | 128.250 | 256.500 | | 818.500 | 868.500 |
| | 58 | 64.375 | 128.750 | 257.500 | | 819.000 | 869.000 |
| 59 | | 64.625 | 129.250 | 258.500 | | 819.500 | 869.500 |
| | 60 | 64.875 | 129.750 | 259.500 | | 820.000 | 870.000 |
| 61 | | 65.125 | 130.250 | 260.500 | | 820.500 | 870.500 |
| | 62 | 65.375 | 130.750 | 261.500 | | 821.000 | 871.000 |
| 63 | | 65.625 | 131.250 | 262.500 | | 821.500 | 871.500 |
| | 64 | 65.875 | 131.750 | 263.500 | | 822.000 | 872.000 |
| 65 | | 66.125 | 132.250 | 264.500 | | 822.500 | 872.500 |
| | 66 | 66.375 | 132.750 | 265.500 | | 823.000 | 873.000 |
| 67 | | 66.625 | 133.250 | 266.500 | | 823.500 | 873.500 |
| | 68 | 66.875 | 133.750 | 267.500 | 401.250 | 824.000 | 874.000 |
| 69 | | 67.125 | 134.250 | 268.500 | 402.750 | 824.500 | 874.500 |
| | 70 | 67.375 | 135.750 | 269.500 | 404.250 | 825.000 | 875.000 |
| 71 | | 67.625 | 135.250 | 270.500 | 405.750 | 825.500 | 875.500 |
| | 72 | 67.875 | 135.750 | 271.500 | 407.250 | 826.000 | 876.000 |
| 73 | | 68.125 | 136.250 | 272.500 | 408.750 | 826.500 | 876.500 |
| | 74 | 68.375 | 136.750 | 273.500 | 410.250 | 827.000 | 877.000 |
| 75 | | 68.625 | 137.250 | 274.500 | 411.750 | 827.500 | 877.500 |
| | 76 | 68.875 | 137.750 | 275.500 | 413.250 | 828.000 | 878.000 |
| 77 | | 69.125 | 138.250 | 276.500 | 414.750 | 828.500 | 878.500 |
| | 78 | 69.375 | 138.750 | 277.500 | 416.250 | 829.000 | 979.000 |
| 79 | | 69.625 | 139.250 | 278.500 | 417.750 | 829.500 | 879.500 |
| | 80 | 69.875 | 139.750 | 279.500 | 419.250 | 830.000 | 880.000 |
| 81 | | 70.125 | 140.250 | 280.500 | 420.750 | 830.500 | 880.500 |
| | 82 | 70.375 | 140.750 | 281.500 | 422.250 | 831.000 | 881.000 |
| 83 | | 70.625 | 141.250 | 282.500 | 423.750 | 831.500 | 881.500 |
| | 84 | 70.875 | 141.750 | 283.500 | 425.250 | 832.000 | 882.000 |
| 85 | | 71.125 | 142.250 | 284.500 | 426.750 | 832.500 | 882.500 |
| | 86 | 71.375 | 142.750 | 285.500 | 428.250 | 833.000 | 883.000 |
| 87 | | 71.625 | 143.250 | 286.500 | 429.750 | 833.500 | 883.500 |
| | 88 | 71.875 | 143.750 | 287.500 | 431.250 | 834.000 | 884.000 |
| 89 | | 72.125 | 144.250 | 288.500 | 432.750 | 834.500 | 884.500 |
| | 90 | 72.375 | 144.750 | 289.500 | 434.250 | 835.000 | 885.000 |
| 91 | | 72.625 | 145.250 | 290.500 | 435.750 | 835.500 | 885.500 |
| | 92 | 72.875 | 145.750 | 291.500 | 437.250 | 836.000 | 886.000 |
| 93 | | 73.125 | 146.250 | 292.500 | 438.750 | 836.500 | 886.500 |
| | 94 | 73.375 | 146.750 | 293.500 | 440.250 | 837.000 | 887.000 |
| 95 | | 73.625 | 147.250 | 294.500 | 441.750 | 837.500 | 887.500 |
| | 96 | 73.875 | 147.750 | 295.500 | 443.250 | 838.000 | 888.000 |
| 97 | | 74.125 | 148.250 | 296.500 | 444.750 | 838.500 | 888.500 |
| | 98 | 74.375 | 148.750 | 297.500 | 446.250 | 839.000 | 889.000 |

| RF channel No. | | A-band (50–100 mc) | B-band (100–225 mc) | C-band (225–400 mc) | D-band (400–600 mc) | F-band | |
|---|---|---|---|---|---|---|---|
| Odd | Even | | | | | Low (790–915 mc) | High (840–965 mc) |
| 99 | ---------- | 74.625 | 149.250 | 298.500 | 447.750 | 839.500 | 889.500 |
| | 100 | 74.875 | 149.750 | 299.500 | 449.250 | 840.000 | 890.000 |
| 101 | ---------- | 75.125 | 150.250 | 300.500 | 450.750 | 840.500 | 890.500 |
| | 102 | 75.375 | 150.750 | 301.500 | 452.250 | 841.000 | 891.000 |
| 103 | ---------- | 75.625 | 151.250 | 302.500 | 453.750 | 841.500 | 891.500 |
| | 104 | 75.875 | 151.750 | 303.500 | 455.250 | 842.000 | 892.000 |
| 105 | ---------- | 76.125 | 152.250 | 304.500 | 456.750 | 842.500 | 892.500 |
| | 106 | 76.375 | 152.750 | 305.500 | 458.250 | 843.000 | 893.000 |
| 107 | ---------- | 76.625 | 153.250 | 306.500 | 459.750 | 843.500 | 893.500 |
| | 108 | 76.875 | 153.750 | 307.500 | 461.250 | 844.000 | 894.000 |
| 109 | ---------- | 77.125 | 154.250 | 308.500 | 462.750 | 844.500 | 894.500 |
| | 110 | 77.375 | 154.750 | 309.500 | 464.250 | 845.000 | 895.000 |
| 111 | ---------- | 77.625 | 155.250 | 310.500 | 465.750 | 845.500 | 895.500 |
| | 112 | 77.875 | 155.750 | 311.500 | 467.250 | 846.000 | 896.000 |
| 113 | ---------- | 78.125 | 156.250 | 312.500 | 468.750 | 846.500 | 896.500 |
| | 114 | 78.375 | 156.750 | 313.500 | 470.250 | 847.000 | 897.000 |
| 115 | ---------- | 78.625 | 157.250 | 314.500 | 471.750 | 847.500 | 897.500 |
| | 116 | 78.875 | 157.750 | 315.500 | 473.250 | 848.000 | 898.000 |
| 117 | ---------- | 79.125 | 158.250 | 316.500 | 474.750 | 848.500 | 898.500 |
| | 118 | 79.375 | 158.750 | 317.500 | 476.250 | 849.000 | 899.000 |
| 119 | ---------- | 79.625 | 159.250 | 318.500 | 477.750 | 849.500 | 899.500 |
| | 120 | 79.875 | 159.750 | 319.500 | 479.250 | 850.000 | 900.000 |
| 121 | ---------- | 80.125 | 160.250 | 320.500 | 480.750 | 850.500 | 900.500 |
| | 122 | 80.375 | 160.750 | 321.500 | 482.250 | 851.000 | 901.000 |
| 123 | ---------- | 80.625 | 161.250 | 322.500 | 483.750 | 851.500 | 901.500 |
| | 124 | 80.875 | 161.750 | 323.500 | 485.250 | 852.000 | 902.000 |
| 125 | ---------- | 81.125 | 162.250 | 324.500 | 486.750 | 852.500 | 902.500 |
| | 126 | 81.375 | 162.750 | 325.500 | 488.250 | 853.000 | 903.000 |
| 127 | ---------- | 81.625 | 163.250 | 326.500 | 489.750 | 853.500 | 903.500 |
| | 128 | 81.875 | 163.750 | 327.500 | 491.250 | 854.000 | 904.000 |
| 129 | ---------- | 82.125 | 164.250 | 328.500 | 492.750 | 854.500 | 904.500 |
| | 130 | 82.375 | 164.750 | 329.500 | 494.250 | 855.000 | 905.000 |
| 131 | ---------- | 82.625 | 165.250 | 330.500 | 495.750 | 855.500 | 905.500 |
| | 132 | 82.875 | 165.750 | 331.500 | 497.250 | 856.000 | 906.000 |
| 133 | ---------- | 83.125 | 166.250 | 332.500 | 498.750 | 856.500 | 906.500 |
| | 134 | 83.375 | 166.750 | 333.500 | 500.250 | 857.000 | 907.000 |
| 135 | ---------- | 83.625 | 167.250 | 334.500 | 501.750 | 857.500 | 907.500 |
| | 136 | 83.875 | 167.750 | 335.500 | 503.250 | 858.000 | 908.000 |
| 137 | ---------- | 84.125 | 168.250 | 336.500 | 504.750 | 858.500 | 908.500 |
| | 138 | 84.375 | 168.750 | 337.500 | 506.250 | 859.000 | 909.000 |
| 139 | ---------- | 84.625 | 169.250 | 338.500 | 507.750 | 859.500 | 909.500 |
| | 140 | 84.875 | 169.750 | 339.500 | 509.250 | 860.000 | 910.000 |
| 141 | ---------- | 85.125 | 170.250 | 340.500 | 510.750 | 860.500 | 910.500 |
| | 142 | 85.375 | 170.750 | 341.500 | 512.250 | 861.000 | 911.000 |
| 143 | ---------- | 85.625 | 171.250 | 342.500 | 513.750 | 861.500 | 911.500 |
| | 144 | 85.875 | 171.750 | 343.500 | 515.250 | 862.000 | 912.000 |
| 145 | ---------- | 86.125 | 172.250 | 344.500 | 516.750 | 862.500 | 912.500 |
| | 146 | 86.375 | 172.750 | 345.500 | 518.250 | 863.000 | 913.000 |
| 147 | ---------- | 86.625 | 173.250 | 346.500 | 519.750 | 863.500 | 913.500 |
| | 148 | 86.875 | 173.750 | 347.500 | 521.250 | 864.000 | 914.000 |
| 149 | ---------- | 87.125 | 174.250 | 348.500 | 522.750 | 864.500 | 914.500 |
| | 150 | 87.375 | 174.750 | 349.500 | 524.250 | 865.000 | 915.000 |
| 151 | ---------- | 87.625 | 175.250 | 350.500 | 525.750 | 865.500 | 915.050 |
| | 152 | 87.875 | 175.750 | 351.500 | 527.250 | 866.000 | 916.000 |
| 153 | ---------- | 88.125 | 176.250 | 352.500 | 528.750 | 866.500 | 916.500 |
| | 154 | 88.375 | 176.750 | 353.500 | 530.250 | 867.000 | 917.000 |
| 155 | ---------- | 88.625 | 177.250 | 354.500 | 531.750 | 867.500 | 917.500 |
| | 156 | 88.875 | 177.750 | 355.500 | 533.250 | 868.000 | 918.000 |

| RF channel No. | | A-band (50–100 mc) | B-band (100–225 mc) | C-band (225–400 mc) | D-band (400–600 mc) | F-band | |
|---|---|---|---|---|---|---|---|
| Odd | Even | | | | | Low (790–915 mc) | High (840–965 mc) |
| 157 | | 89.125 | 178.250 | 356.500 | 534.750 | 868.500 | 918.500 |
| | 158 | 89.375 | 178.750 | 357.500 | 536.250 | 869.000 | 919.000 |
| 159 | | 89.625 | 179.250 | 358.500 | 537.750 | 869.500 | 919.500 |
| | 160 | 89.875 | 179.750 | 359.500 | 539.250 | 870.000 | 920.000 |
| 161 | | 90.125 | 180.250 | 360.500 | 540.750 | 870.500 | 920.500 |
| | 162 | 90.375 | 180.750 | 361.500 | 542.250 | 871.000 | 921.000 |
| 163 | | 90.625 | 181.250 | 362.500 | 543.750 | 871.500 | 921.500 |
| | 164 | 90.875 | 181.750 | 363.500 | 545.250 | 872.000 | 922.000 |
| 165 | | 91.125 | 182.250 | 364.500 | 546.750 | 872.500 | 922.500 |
| | 166 | 91.375 | 182.750 | 365.500 | 548.250 | 873.000 | 923.000 |
| 167 | | 91.625 | 183.250 | 366.500 | 549.750 | 873.500 | 923.500 |
| | 168 | 91.875 | 183.750 | 367.500 | 551.250 | 874.000 | 924.000 |
| 169 | | 92.125 | 184.250 | 368.500 | 552.750 | 874.500 | 924.500 |
| | 170 | 92.375 | 184.750 | 369.500 | 554.250 | 875.000 | 925.000 |
| 171 | | 92.625 | 185.250 | 370.500 | 555.750 | 875.500 | 925.500 |
| | 172 | 92.875 | 185.750 | 371.500 | 557.250 | 876.000 | 926.000 |
| 173 | | 93.125 | 186.250 | 372.500 | 558.750 | 876.500 | 926.500 |
| | 174 | 93.375 | 186.750 | 373.500 | 560.250 | 877.000 | 927.000 |
| 175 | | 93.625 | 187.250 | 374.500 | 561.750 | 877.500 | 927.500 |
| | 176 | 93.875 | 187.750 | 375.500 | 563.250 | 878.000 | 928.000 |
| 177 | | 94.125 | 188.250 | 376.500 | 564.750 | 878.500 | 928.500 |
| | 178 | 94.375 | 188.750 | 377.500 | 566.250 | 879.000 | 929.000 |
| 179 | | 94.625 | 189.250 | 378.500 | 567.750 | 879.500 | 929.500 |
| | 180 | 94.875 | 189.750 | 379.500 | 569.250 | 880.000 | 930.000 |
| 181 | | 95.125 | 190.250 | 380.500 | 570.750 | 880.500 | 930.500 |
| | 182 | 95.375 | 190.750 | 381.500 | 572.250 | 881.000 | 931.000 |
| 183 | | 95.625 | 191.250 | 382.500 | 573.750 | 881.500 | 931.500 |
| | 184 | 95.875 | 191.750 | 383.500 | 575.250 | 882.000 | 932.000 |
| 185 | | 96.125 | 192.250 | 384.500 | 576.750 | 882.500 | 932.500 |
| | 186 | 96.375 | 192.750 | 385.500 | 578.250 | 883.000 | 933.000 |
| 187 | | 96.625 | 193.250 | 386.500 | 579.750 | 883.500 | 933.500 |
| | 188 | 96.875 | 193.750 | 387.500 | 581.250 | 884.000 | 934.000 |
| 189 | | 97.125 | 194.250 | 388.500 | 582.750 | 884.500 | 934.500 |
| | 190 | 97.375 | 194.750 | 389.500 | 584.250 | 885.000 | 935.000 |
| 191 | | 97.625 | 195.250 | 390.500 | 585.750 | 885.500 | 935.500 |
| | 192 | 97.875 | 195.750 | 391.500 | 587.250 | 886.000 | 936.000 |
| 193 | | 98.125 | 196.250 | 392.500 | 588.750 | 886.500 | 936.500 |
| | 194 | 98.375 | 196.750 | 393.500 | 590.250 | 877.000 | 937.000 |
| 195 | | 98.625 | 197.250 | 394.500 | 591.750 | 887.500 | 937.500 |
| | 196 | 98.875 | 197.750 | 395.500 | 593.250 | 888.000 | 938.000 |
| 197 | | 99.125 | 198.250 | 396.500 | 594.750 | 888.500 | 938.500 |
| | 198 | 99.375 | 198.750 | 397.500 | 596.250 | 889.000 | 939.000 |
| 199 | | 99.625 | 199.250 | 398.500 | 597.750 | 889.500 | 939.500 |
| | 200 | 99.875 | 199.750 | 399.500 | 599.250 | 890.000 | 940.000 |
| 201 | | | 200.250 | | | 890.500 | 940.500 |
| | 202 | | 200.750 | | | 891.000 | 941.000 |
| 203 | | | 201.250 | | | 891.500 | 941.500 |
| | 204 | | 201.750 | | | 892.000 | 942.000 |
| 205 | | | 202.250 | | | 892.500 | 942.500 |
| | 206 | | 202.750 | | | 893.000 | 943.000 |
| 207 | | | 203.250 | | | 893.500 | 943.500 |
| | 208 | | 203.750 | | | 894.000 | 944.000 |
| 209 | | | 204.250 | | | 894.500 | 944.500 |
| | 210 | | 204.750 | | | 895.000 | 945.000 |
| 211 | | | 205.250 | | | 895.500 | 945.500 |
| | 212 | | 205.750 | | | 896.000 | 946.000 |
| 213 | | | 206.250 | | | 896.500 | 946.500 |
| | 214 | | 206.750 | | | 897.000 | 947.000 |

| RF channel No. | | A-band (50–100 mc) | B-band (100–225 mc) | C-band (225–400 mc) | D-band (400–600 mc) | F-band | |
|---|---|---|---|---|---|---|---|
| Odd | Even | | | | | Low (790–915 mc) | High (840–965 mc) |
| 215 | | | 207.250 | | | 897.500 | 947.500 |
| | 216 | | 207.750 | | | 898.000 | 948.000 |
| 217 | | | 208.250 | | | 898.500 | 948.500 |
| | 218 | | 208.750 | | | 899.000 | 949.000 |
| 219 | | | 209.250 | | | 899.500 | 949.500 |
| | 220 | | 209.750 | | | 900.000 | 950.000 |
| 221 | | | 210.250 | | | 900.500 | 950.500 |
| | 222 | | 210.750 | | | 901.000 | 951.000 |
| 223 | | | 211.250 | | | 901.500 | 951.500 |
| | 224 | | 211.750 | | | 902.000 | 952.000 |
| 225 | | | 212.250 | | | 902.500 | 952.500 |
| | 226 | | 212.750 | | | 903.000 | 953.000 |
| 227 | | | 213.250 | | | 903.500 | 953.500 |
| | 228 | | 213.750 | | | 904.000 | 954.000 |
| 229 | | | 214.250 | | | 904.500 | 954.500 |
| | 230 | | 214.750 | | | 905.000 | 955.000 |
| 231 | | | 215.250 | | | 905.500 | 955.500 |
| | 232 | | 215.750 | | | 906.000 | 956.000 |
| 233 | | | 216.250 | | | 906.500 | 956.500 |
| | 234 | | 216.750 | | | 907.000 | 957.000 |
| 235 | | | 217.250 | | | 907.500 | 957.500 |
| | 236 | | 217.750 | | | 908.000 | 958.000 |
| 237 | | | 218.250 | | | 908.500 | 958.500 |
| | 238 | | 218.750 | | | 909.000 | 959.000 |
| 239 | | | 219.250 | | | 909.500 | 959.500 |
| | 240 | | 219.750 | | | 910.000 | 960.000 |
| 241 | | | 220.250 | | | 910.500 | 960.500 |
| | 242 | | 220.750 | | | 911.000 | 961.000 |
| 243 | | | 221.250 | | | 911.500 | 961.500 |
| | 244 | | 221.750 | | | 912.000 | 962.000 |
| 245 | | | 222.250 | | | 912.500 | 962.500 |
| | 246 | | 222.750 | | | 913.000 | 963.000 |
| 247 | | | 223.250 | | | 913.500 | 963.500 |
| | 248 | | 223.750 | | | 914.000 | 964.000 |
| 249 | | | 224.250 | | | 914.500 | 964.500 |
| | 250 | | 224.750 | | | 915.000 | 965.000 |

*d. Limitations of RF Channel Number Frequency Assignments (F-band).* When the F-band transmitter head is used with the T–302(*)/TRC and the F-band receiver tuning head is used with the R–417(*)/TRC, the R–417(*)/TRC at the T–302(*)/TRC site, will receive interference from the T–302(*)/TRC in some instances. This interference will be produced only if the T–302(*)/TRC and the R–417(*)/TRC are tuned to certain RF channel numbers. Consideration must be given to this factor when RF channel numbers or frequency allocations are assigned. The charts below indicate the RF channel numbers of the T–302(*)/TRC that will produce interference in the R–417(*)/TRC and also indicates RF channel numbers of the R–417(*)/TRC that will receive the interference. The chart in (1) below lists the RF channel numbers for the F–band (*low*) and the chart in (2) below lists the RF channel numbers for the F-band (*high*). Interference will also occur when the R–417(*)/TRC and the T–302(*)/TRC are operated on even adjacent RF channel numbers.

*Note.* The RF channel numbers listed in the *Weak* column for the T–302(*)/TRC will produce interference of 6 microvolts or less in the R–147(*)/TRC.

(1) *F-band (low).*

| T–302(*)/TRC RF channel number producing interference | | R–417(*)/TRC RF channel number receiving interference |
|---|---|---|
| Weak | Strong | |
| | 1, 193, 195 | 1 |
| | 3, 193, 195 | 3 |
| 65 | 5, 193, 197 | 5 |
| 65 | 7, 191, 197 | 7 |
| 65 | 9, 191, 197 | 9 |
| | 11, 191 | 11 |
| | 13, 189, 199 | 13 |
| | 15, 189, 199 | 15 |
| 67 | 17, 189, 199 | 17 |
| 67 | 19, 187 | 19 |
| 67 | 21, 187, 201 | 21 |
| | 23, 187, 201 | 23 |
| | 25, 185, 201 | 25 |
| | 27, 185 | 27 |
| 1–249 | 29, 185, 203 | 29[a] |
| 1–249 | 31, 183, 203 | 31[a] |
| 69 | 33, 183, 203 | 33 |
| | 35, 183 | 35 |
| | 37, 181, 205 | 37 |
| | 39, 181, 205 | 39 |
| 71 | 41, 181, 205 | 41 |
| 71 | 43, 179 | 43 |
| 71 | 45, 179, 207 | 45 |
| | 47, 179, 207 | 47 |
| | 49, 177, 207 | 49 |
| | 51, 177 | 51 |
| 73 | 53, 177, 209 | 53 |
| 73 | 55, 175, 209 | 55 |
| 73 | 57, 175, 209 | 57 |
| | 59, 175 | 59 |
| | 61, 173, 211 | 61 |
| | 63, 173, 211 | 63 |
| 75 | 65, 173, 211 | 65 |
| 75 | 67, 171 | 67 |
| 75 | 69, 171, 213 | 69 |
| | 71, 171, 213 | 71 |
| | 73, 169, 213 | 73 |
| | 75, 169 | 75 |
| 77 | 79, 169, 215 | 77 |
| 77 | 79, 167, 215 | 79 |
| 77 | 81, 167, 215 | 81 |
| | 83, 167 | 83 |
| | 85, 165, 217 | 85 |
| | 87, 165, 217 | 87 |
| 79 | 89, 165, 217 | 89 |
| 79 | 91, 168 | 91 |
| 79 | 93, 163, 219 | 93 |
| | 95, 163, 219 | 95 |
| | 97, 161, 219 | 97 |
| | 99, 161 | 99 |
| 81 | 101, 161, 221 | 101 |
| 81 | 103, 159, 221 | 103 |
| 81 | 105, 159, 221 | 105 |
| 1–249 | 107, 159 | 107[b] |
| | 109, 157, 223 | 109 |
| | 111, 157, 223 | 111 |
| 83 | 113, 157, 223 | 113 |
| 83 | 115, 155 | 115 |
| 83 | 117, 155, 225 | 117 |
| | 119, 155, 225 | 119 |
| | 121, 153, 225 | 121 |
| | 123, 153 | 123 |
| 85 | 125, 153, 227 | 125 |
| 85 | 127, 151, 227 | 127 |
| 85 | 129, 151, 227 | 129 |
| | 131, 151 | 131 |
| | 133, 149, 229 | 133 |
| | 135, 149, 229 | 135 |
| 87 | 137, 149, 229 | 137 |
| 87 | 139, 147 | 139 |
| 87 | 141, 147, 231 | 141 |
| | 143, 147, 231 | 143 |
| | 145, 231 | 145 |
| | 145, 147 | 147 |
| 89 | 145, 149, 233 | 149 |
| 89 | 143, 151, 233 | 151 |
| 89 | 143, 153, 233 | 153 |
| | 143, 155 | 155 |
| | 141, 157, 235 | 157 |
| | 141, 159, 235 | 159 |
| 91 | 141, 161, 235 | 161 |
| 91 | 139, 163 | 163 |
| 91 | 139, 165, 237 | 165 |
| | 139, 167, 237 | 167 |
| | 137, 169, 237 | 169 |
| | 137, 171 | 171 |
| 93 | 137, 173, 239 | 173 |
| 93 | 135, 175, 239 | 175 |
| 93 | 135, 177, 239 | 177 |
| | 135, 179 | 179 |
| | 133, 181, 241 | 181 |
| | 133, 183, 241 | 183 |
| 95 | 133, 185, 241 | 185 |
| 95 | 131, 187 | 187 |
| 95 | 131, 189, 243 | 189 |
| | 131, 191, 243 | 191 |
| | 129, 193, 243 | 193 |
| | 129, 195 | 195 |
| 97 | 129, 197, 245 | 197 |
| 97 | 127, 199, 245 | 199 |
| 1, 97 | 127, 201, 245 | 201 |
| 97 | 127, 203 | 203 |
| 3 | 125, 205, 247 | 205 |
| | 125, 207, 247 | 207 |
| 5, 99 | 125, 209, 247 | 209 |
| 99 | 123, 211 | 211 |
| 7, 99 | 123, 213, 249 | 213 |
| | 123, 215, 249 | 215 |
| 9 | 121, 217, 249 | 217 |
| | 121, 219 | 219 |
| 11, 101 | 121, 221 | 221 |
| 101 | 119, 223 | 223 |
| 13, 101 | 119, 225 | 225 |
| | 119, 227 | 227 |

| T–302(*)/TRC RF channel number producing interference | | R–417(*)/TRC RF channel number receiving interference |
|---|---|---|
| Weak | Strong | |
| 15 | 117, 229 | 229 |
| | 117, 231 | 231 |
| 17, 103 | 117, 233 | 233 |
| 103 | 115, 235 | 235 |
| 19, 103 | 115, 237 | 237 |
| | 115, 239 | 239 |
| 21 | 113, 241 | 241 |
| | 113, 243 | 243 |
| 23, 105 | 113, 245 | 245 |
| 105 | 111, 247 | 247 |
| 25, 105 | 111, 249 | 249 |

[a] Do not use RF channel numbers 29 or 31 on T–302(*)/TRC or R–147(*)/TRC.

[b] Use RF channel number 107 on R–417(*)/TRC only for short distances. Rf channel number 107 (low) band may be used on T–302(*)/TRC with RF channel number 7 (high) band on R–417(*)/RTC.

(2) *F-band (high).*

| T–302(*)/TRC RF channel number producing interference | | R–417(*)/TRF RF channel number receiving interference |
|---|---|---|
| Weak | Strong | |
| 13, 81 | 1, 221, 227 | 1 |
| 13, 81 | 3, 221, 227 | 3 |
| 13, 81 | 5, 119, 221, 225 | 5 |
| 13 | 7, 119, 225 | 7 |
| 13 | 9, 119, 223, 225 | 9 |
| 13 | 11, 223 | 11 |
| 11, 83 | 13, 117, 223 | 13 |
| 11, 83 | 15, 117, 223 | 15 |
| 11, 83 | 17, 117, 223, 225 | 17 |
| 11 | 19, 221, 225 | 19 |
| 11 | 21, 115, 221, 225 | 21 |
| 11 | 23, 115, 219 | 23 |
| 9, 85 | 25, 115, 219, 227 | 25 |
| 9, 85 | 27, 219, 227 | 27 |
| 9, 85 | 29, 113, 217, 227 | 29 |
| 9 | 31, 113, 217 | 31 |
| 9 | 33, 113, 217, 229 | 33 |
| 9 | 35, 215, 229 | 35 |
| 7, 87 | 37, 111, 215, 229 | 37 |
| 7, 87 | 39, 111, 215 | 39 |
| 7, 87 | 41, 111, 213, 231 | 41 |
| 7 | 43, 213, 231 | 43 |
| 7 | 45, 109, 213, 231 | 45 |
| 1–249 | 47, 209, 221 | 47[a] |
| 1–249 | 49, 109, 211, 233 | 49[a] |
| 5, 89 | 51, 211, 233 | 51 |
| 5, 89 | 53, 107, 209, 233 | 53 |
| 5 | 55, 107, 209 | 55 |
| 5 | 57, 107, 209, 235 | 57 |
| 5 | 59, 207, 235 | 59 |
| 3, 91 | 61, 105, 207, 235 | 61 |
| 3, 91 | 63, 105, 207 | 63 |
| 3, 91 | 65, 105, 205, 237 | 65 |
| 3 | 67, 205, 237 | 67 |
| 3 | 69, 103, 205, 237 | 69 |
| 3 | 71, 103, 203 | 71 |
| 1, 93 | 73, 103, 203, 239 | 73 |
| 1, 93 | 75, 203, 239 | 75 |
| 1, 93 | 79, 101, 201, 239 | 77 |
| 1 | 79, 101, 201 | 79 |
| | 81, 101, 201, 241 | 81 |
| | 83, 199, 241 | 83 |
| 95 | 85, 99, 199, 241 | 85 |
| 95 | 87, 99, 199 | 87 |
| 95 | 89, 99, 197, 243 | 89 |
| | 91, 197, 243 | 91 |
| | 93, 97, 197, 243 | 93 |
| | 95, 97, 195 | 95 |
| 97 | 97, 195, 245 | 97 |
| 97 | 99, 195, 245 | 99 |
| 97 | 95, 101, 193, 245 | 101 |
| | 95, 103, 193 | 103 |
| | 95, 105, 193, 247 | 105 |
| | 107, 191, 247 | 107 |
| 99 | 93, 109, 191, 247 | 109 |
| 99 | 93, 111, 191 | 111 |
| 99 | 93, 113, 189, 249 | 113 |
| | 115, 189, 249 | 115 |
| | 91, 117, 189, 249 | 117 |
| | 91, 119, 187 | 119 |
| | 91, 121, 187 | 121 |
| 101 | 123, 187 | 123 |
| 101 | 89, 125, 185 | 125 |
| | 89, 127, 185 | 127 |
| 1–249 | 89, 129, 185 | 129[b] |
| | 131, 183 | 131 |
| 103 | 87, 133, 183 | 133 |
| 103 | 87, 135, 183 | 135 |
| 103 | 87, 137, 181 | 137 |
| | 139, 181 | 139 |
| | 85, 141, 181 | 141 |
| | 85, 143, 179 | 143 |
| 105 | 85, 145, 179 | 145 |
| 105 | 147, 179 | 147 |
| 105 | 83, 149, 177 | 149 |
| | 83, 151, 177 | 151 |
| | 83, 153, 177 | 153 |
| | 155, 175 | 155 |
| 107 | 81, 157, 175 | 157 |
| 107 | 81, 159, 175 | 159 |
| 107 | 81, 161, 173 | 161 |
| | 163, 173 | 163 |
| | 79, 165, 173 | 165 |
| | 79, 167, 171 | 167 |
| 109 | 79, 169, 171 | 169 |
| 109 | 171 | 171 |
| 109 | 77, 169, 173 | 173 |
| | 77, 169, 175 | 175 |
| | 77, 169, 177 | 177 |
| | 167, 179 | 179 |
| 111 | 75, 167, 181 | 181 |
| 111 | 75, 167, 183 | 183 |

| T–302(*)/TRC RF channel number producing interference | | R–417(*)/TRF RF channel number receiving interference |
|---|---|---|
| Weak | Strong | |
| 111 | 75, 165, 185 | 185 |
| | 165, 187 | 187 |
| | 73, 165, 189 | 189 |
| | 73, 163, 191 | 191 |
| 113 | 73, 163, 193 | 193 |
| 113 | 163, 195 | 195 |
| 113 | 71, 161, 197 | 197 |
| | 71, 161, 199 | 199 |
| 1 | 71, 161, 201 | 201 |
| | 159, 103 | 203 |
| 3, 115 | 69, 159, 205 | 205 |
| 115 | 69, 159, 207 | 207 |
| 5, 115 | 69, 157, 209 | 209 |
| | 157, 211 | 211 |
| 7 | 67, 157, 213 | 213 |
| | 67, 155, 215 | 215 |
| 9, 117 | 67, 155, 217 | 217 |
| 117 | 155, 219 | 219 |
| 11, 117 | 65, 153, 221 | 221 |
| | 65, 153, 223 | 223 |
| 13 | 65, 153, 225 | 225 |
| | 151, 227 | 227 |
| 15, 119 | 63, 151, 229 | 229 |
| 119 | 63, 151, 231 | 231 |
| 17, 119 | 63, 149, 233 | 233 |
| | 149, 235 | 235 |
| 19 | 61, 149, 237 | 237 |
| | 61, 147, 239 | 239 |
| 21, 121 | 61, 147, 241 | 241 |
| 121 | 147, 243 | 243 |
| 23, 121 | 51, 145, 245 | 245 |
| | 59, 145, 247 | 247 |
| 25 | 145, 249 | 249 |

[a] Do not use RF channel numbers 47 or 49 on T–302(*)/TRC or R–417(*)/TRC.

[b] Use RF channel number 129 on R–417(*)/TRC only for short distances. RF channel number 129 (high) band may be used on T–302(*)/TRC with RF channel number 229 (low) band on R–417(*)/TRC.

### *e. Power Supply PP–685(*)/TRC.*

Power requirements — 115 v, 50 to 60 cps, 10 amp.

Power output (dc):
- Regulated — 150 v, 275 ma. 200 to 350 v, 35 ma.
- Unregulated — 250 v, 10 ma, 300 to 900 v, 500 ma, —12 v, 75 ma.

Power output (ac) — 2.5 v, 6.25 amp, 6.3 v, 12 amp, 115 v, 2 amp.

Number of tubes — 10.

### *f. Transformer, Power, Fixed Auto Transformer TF–167/TRC.*

Input voltage — 95 to 130 v or 190 to 260 v, 50 to 60 cps.

Output voltage — 115 v, ±5.5 v, 50 to 60 cps, 16 amp.

### *g. Interconnecting Box J–532/U.*

Input voltage — 95 to 130 v or 190 to 260 v, 50 to 60 cps.

Output voltage:
- 95 to 130 volts — 10 outputs.
- 190 to 260 volts — 6 outputs.

### *h. Switch Box SA–331/U.*

Input voltage — 95 to 130 v or 190 to 260 v, 50 to 60 cps.

Output voltage — 95 to 130 v or 190 to 260 v, 50 to 60 cps (corresponds to input voltage).

### *i. Antenna.*

Type:
- Antenna AS–756/GRC (A-band) — Two three-element, yagi arrays.
- Antenna AS–639/TRC (B-band) — Two half-wave dipoles with plane reflector.
- Antenna AS–640/TRC (C-band) — Two half-wave dipoles with plane reflector.
- Antenna AS–755/GRC (D-band) — Four half-wave dipoles with plane reflector.
- Antenna Assembly AS–1082/TRA–25 (F-band) — Two four-stacked, folded dipoles with plane reflector.

Operating frequency:
- Antenna AS–756/GRC (A-band) — 40 to 100 mcs.
- Antenna AS–639/TRC (B-band) — 100 to 250 mcs.
- Antenna AS–640/TRC (C-band) — 250 to 400 mcs.
- Antenna AS–755/GRC (D-band) — 400 to 600 mcs.
- Antenna Assembly AS–1082/TRA–25 (F-band) — 790 to 965.

Polarization — Horizontal or vertical

Beam width — From 25° to 120° (varies with frequency and polarization).

Gain:
- Antenna AS–756/GRC (A-band) — 5 db.
- Antenna AS–639/TRC (B-band) — 6 db.
- Antenna AS–640/TRC (C-band) — 8 db.
- Antenna AS–755/GRC (D-band) — 10 db.
- Antenna Assembly AS–1082/TRA–25 (F-band) — 12 db.

Major-to-minor lobe ratio — Greater than 8 db.

Mast AB–235/G:
- Type — Tubular steel.
- Number of sections — 9.
- Maximum height — 45 ft.

### *j. Generator Set, Gasoline Engine PU–286/G.*

Refer to TM 11–940A.

## 5. Table of Components

The quantity of component groups comprising a radio set, a radio terminal set, a radio repeater set is provided in *a* below. The quantity of items comprising each component group is provided in *b* below. The running spares are listed in *c* below.

*a. Component Groups of Radio Set, Radio Terminal Set, Radio Relay Set, and Radio Repeater Set.*

(1) *Radio sets.*

| Nomenclature | Quantity | Components | Fig. No. |
|---|---|---|---|
| Radio Set AN/TRC–24 | 1 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Group OA–1389/GRC | 4 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 1 | Amplifier Group OA–1392/GRC (B-band) | 6 |
| | 1 | Antenna-Filter Group OA–1393/GRC (B-band) | 7 |
| | 1 | Amplifier Group OA–1394/GRC (C-band) | 8 |
| | 1 | Antenna-Filter Group OA–1395/GRC (C-band) | 9 |
| | | *Note.* Radio Set Group AN/TRA–25 (F-band) is not a component of the AN/TRC–24, but is used with the AN/TRC–24 (par. 71). | 10 |
| Radio Set AN/GRC–75 | 1 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 1 | Amplifier Group OA–1390/GRC (A-band) | 11 |
| | 1 | Antenna Filter Group OA–1391/GRC (A-band) | 12 |
| Radio Set AN/GRC–78 | 1 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Group OA–1389/GRC | 4 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 1 | Amplifier Group OA–1392/GRC (B-band) | 6 |
| | 1 | Antenna-Filter Group OA–1393/GRC (B-band) | 7 |
| | 1 | Amplifier Group OA–1396/GRC (D-band) | 13 |
| | 1 | Antenna Filter Group OA–1397/GRC (D-band) | 14 |
| | | *Note.* Radio Set Group AN/TRA–25 (F-band) is not a component of the AN/GRC–78, but is used with the AN/GRC–78 (par. 71). | 10 |
| Radio Set AN/GRC–81 | 1 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Group OA–1389/GRC | 4 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 1 | Amplifier Group OA–1394/GRC (C-band) | 8 |
| | 1 | Antenna-Filter Group OA–1395/GRC (C-band) | 9 |

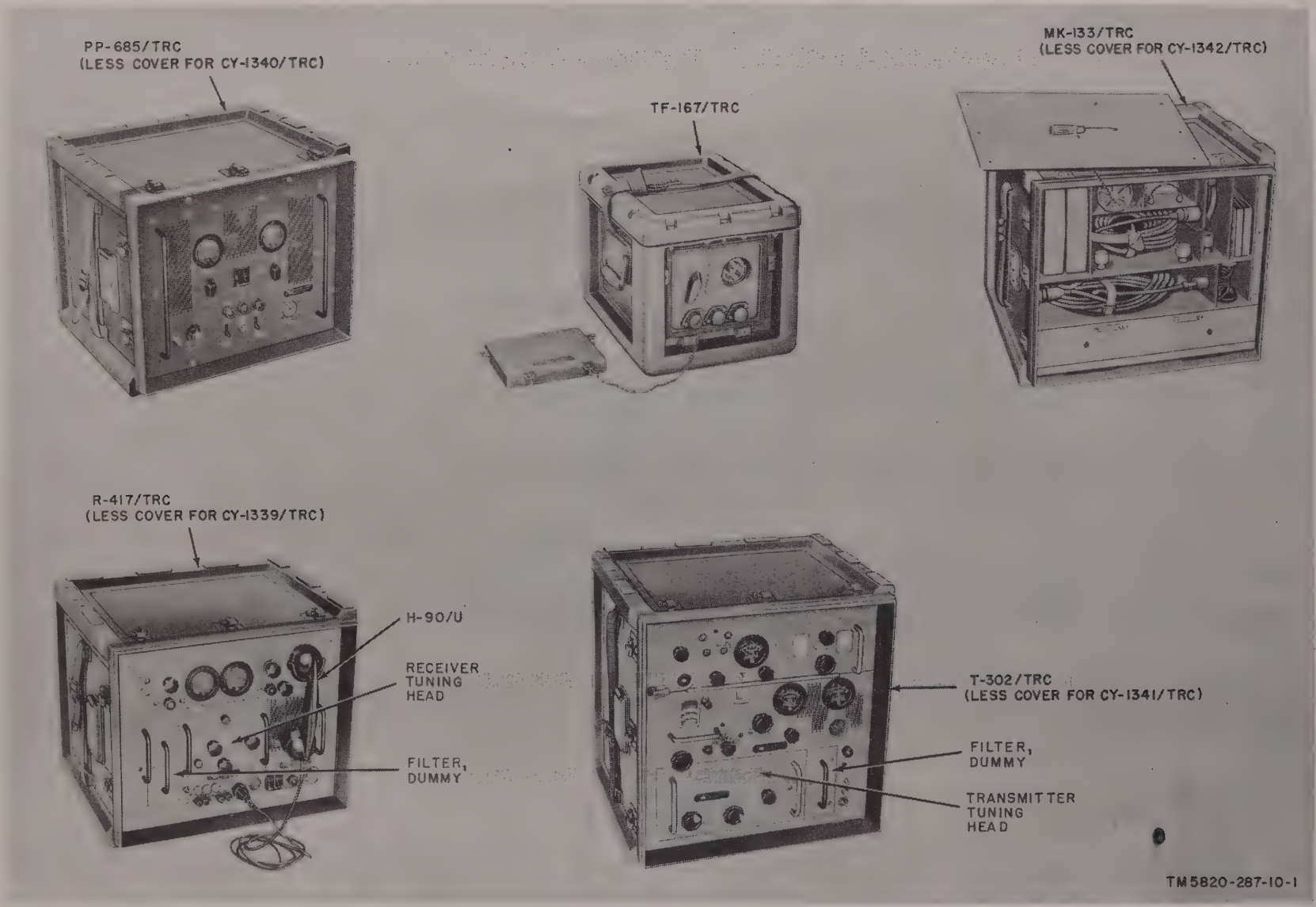



*Figure 1. Radio Set Group OA–1387/GRC with a transmitter tuning head installed in the T–302/TRC and a receiver tuning head and Hardset H–9010 installed in the R–417/TRC.*

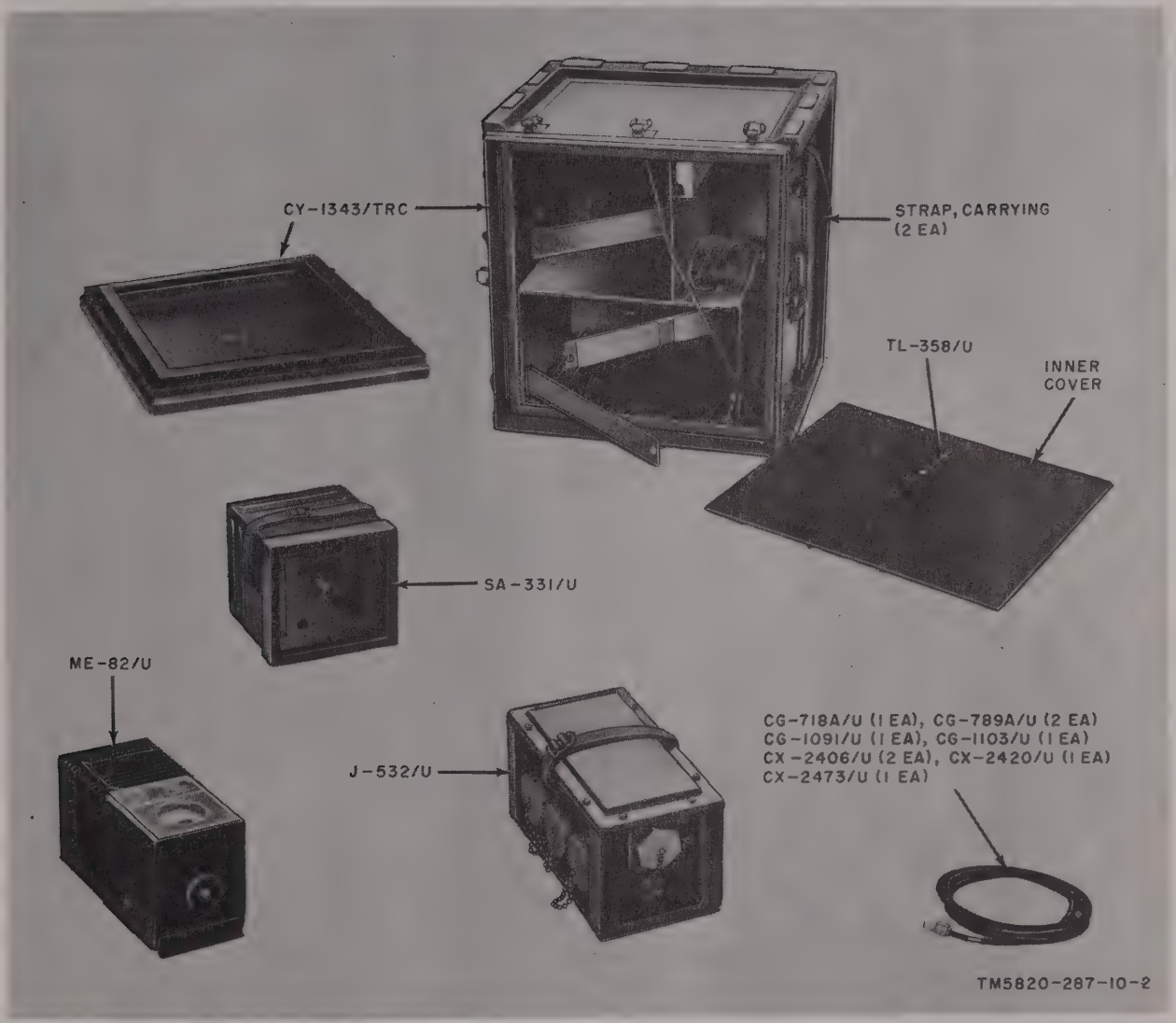



*Figure 2. Power Accessories Group OA-1676/GRC.*

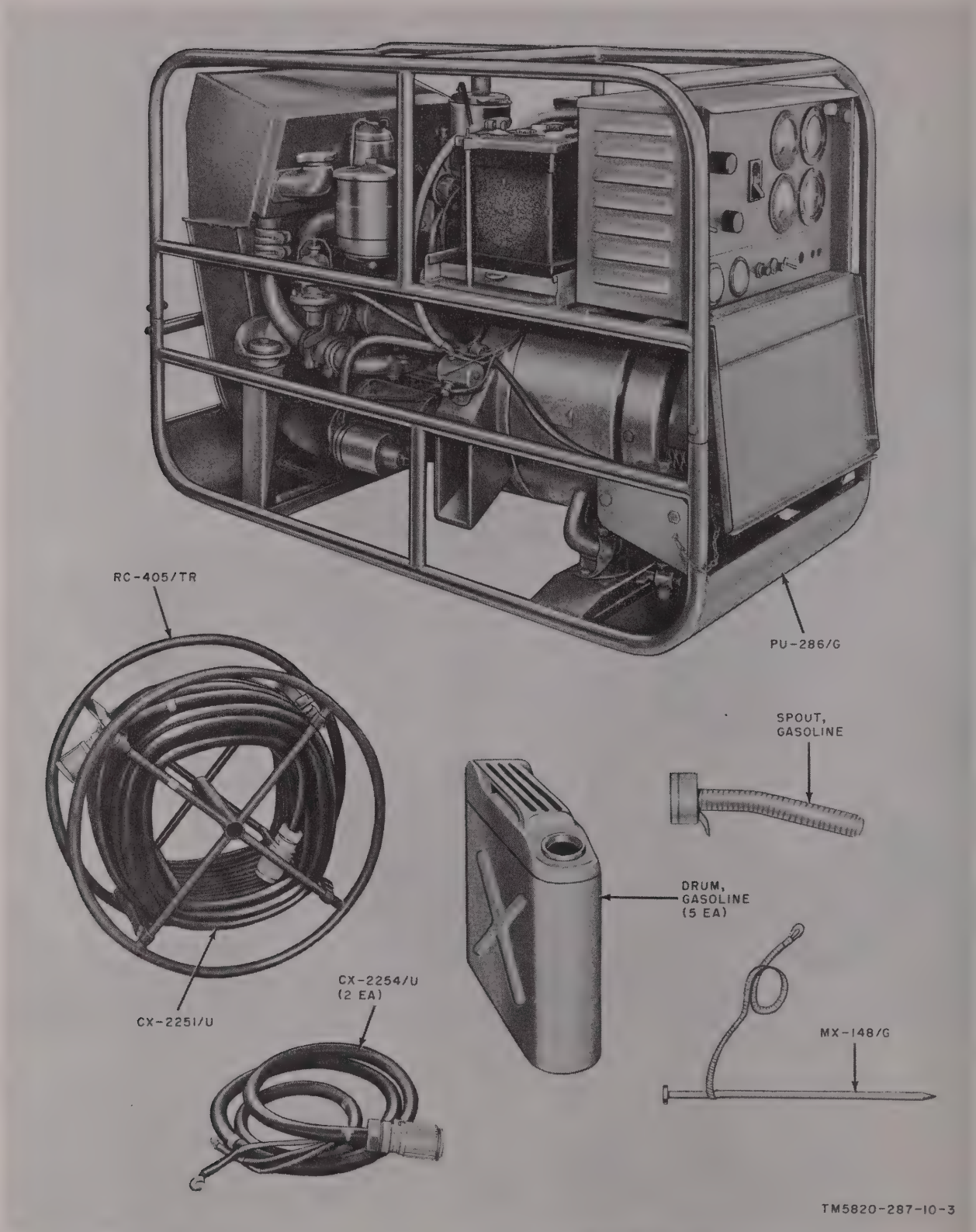



*Figure 3. Generator Set Group OA–1675/GRC.*

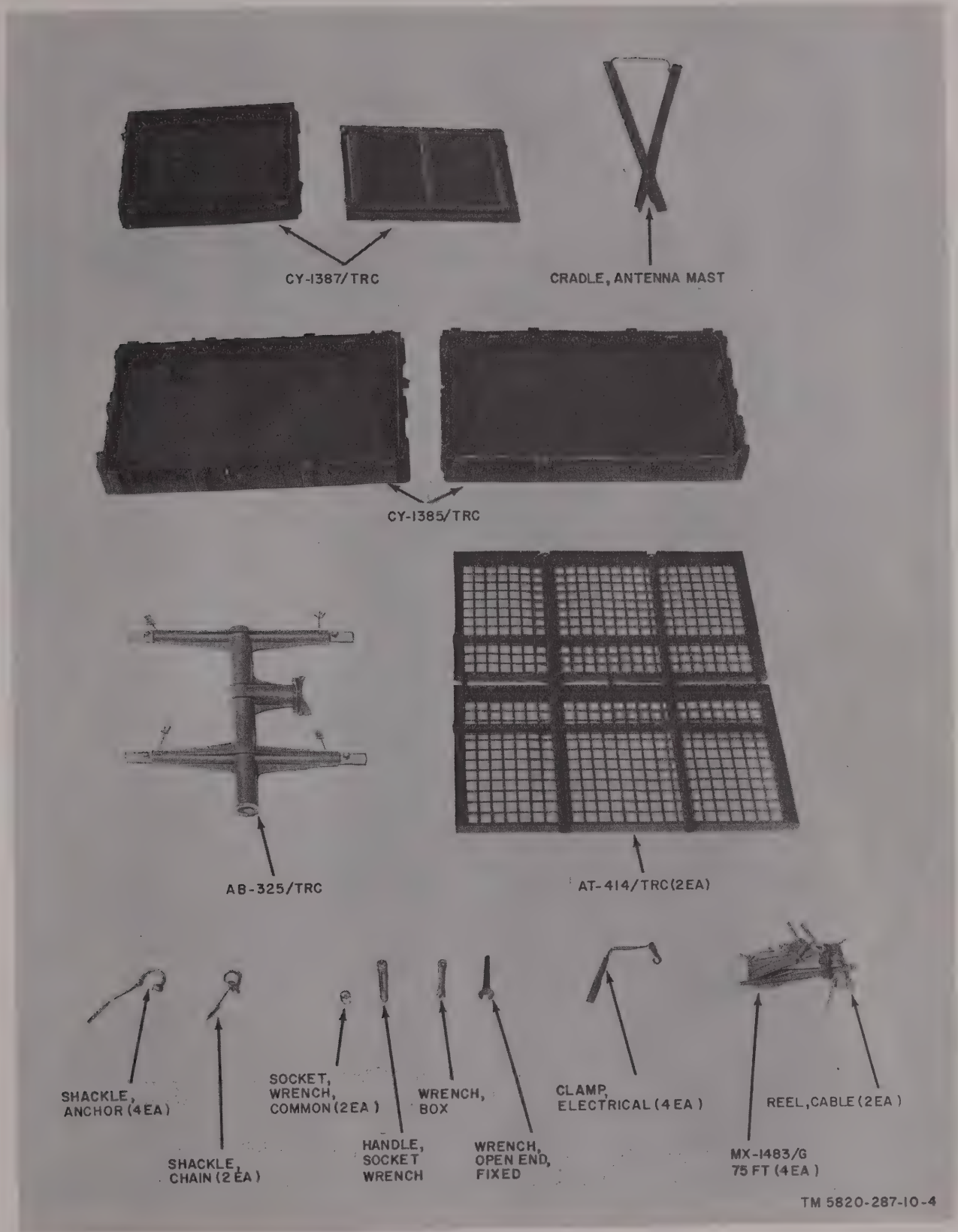



*Figure 4. Antenna Group OA–1398/GRC.*

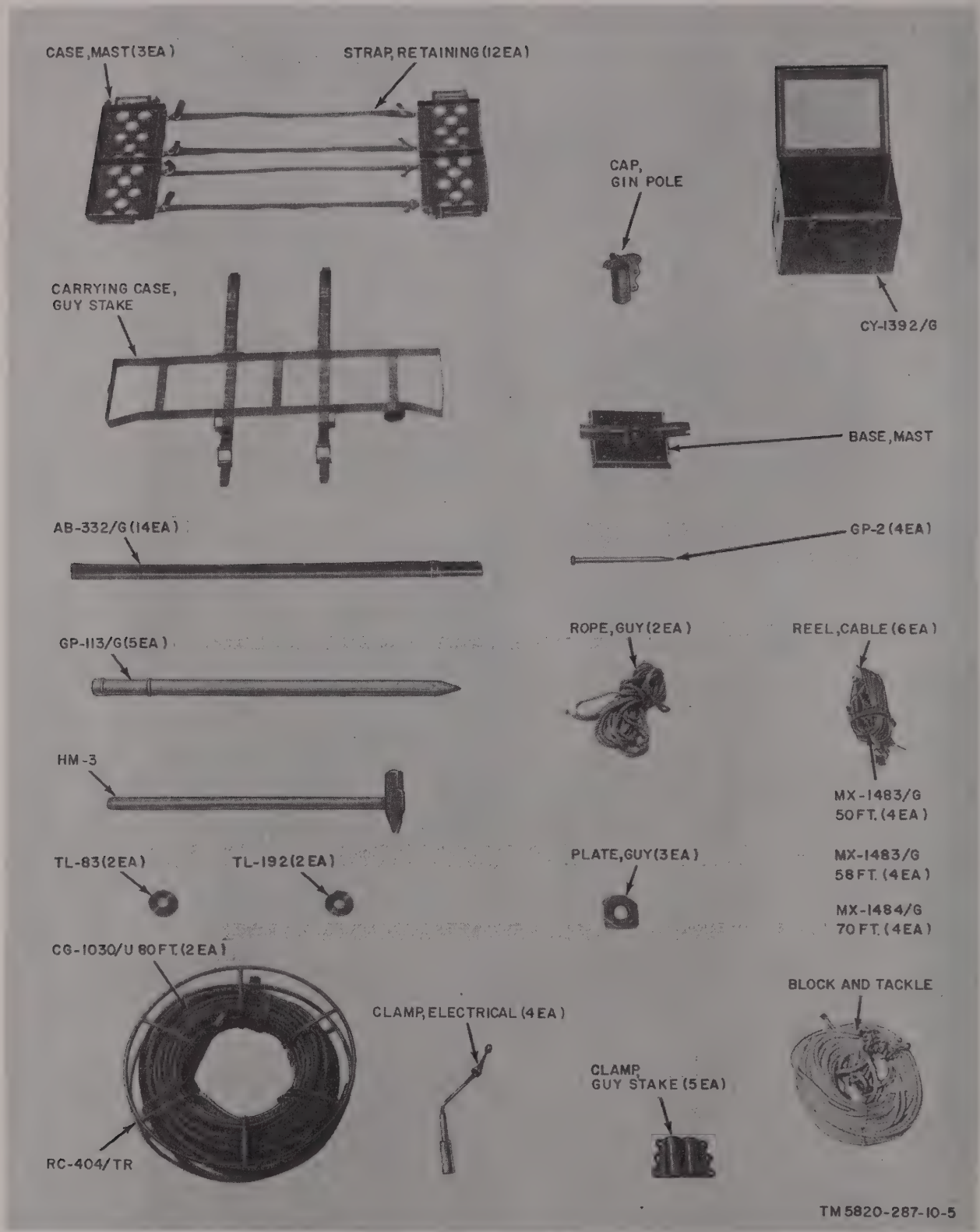



*Figure 5. Antenna Accessories Group OA–1398/GRC.*

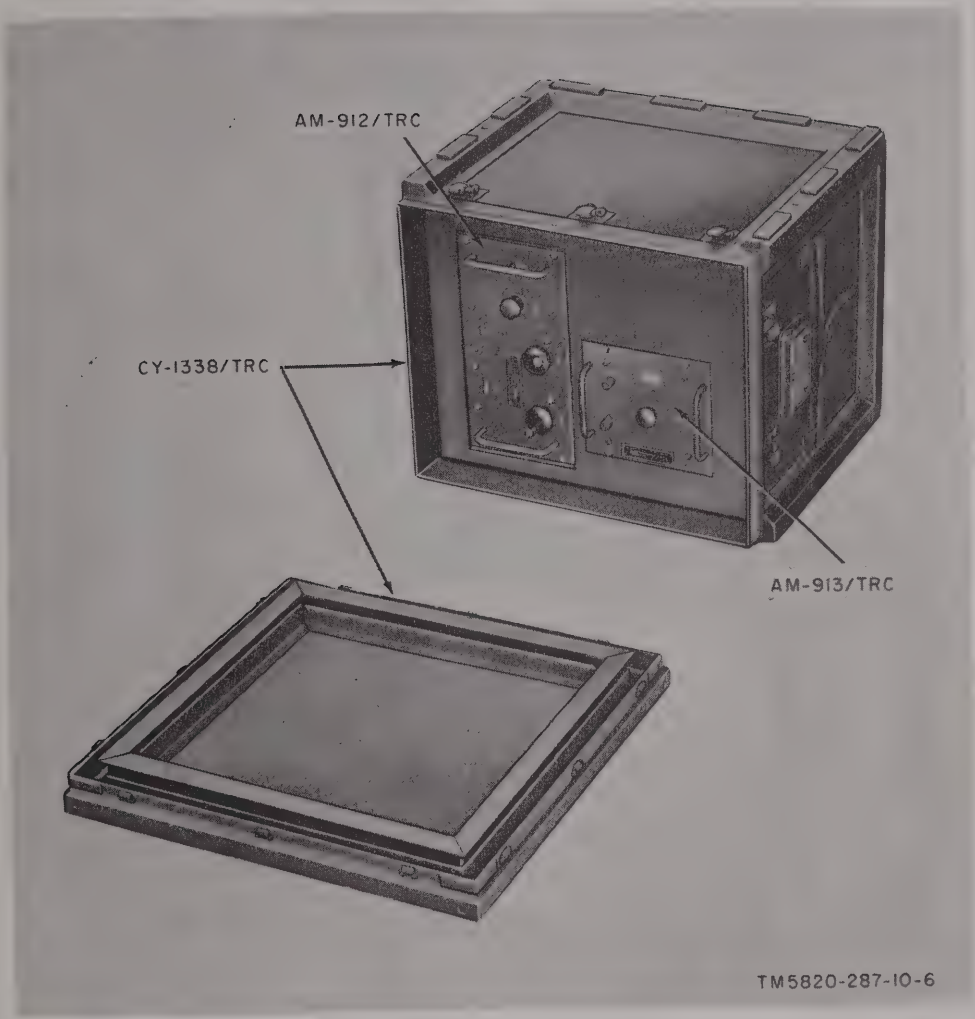



*Figure 6. Amplifier Group OA–1392/GRC.*

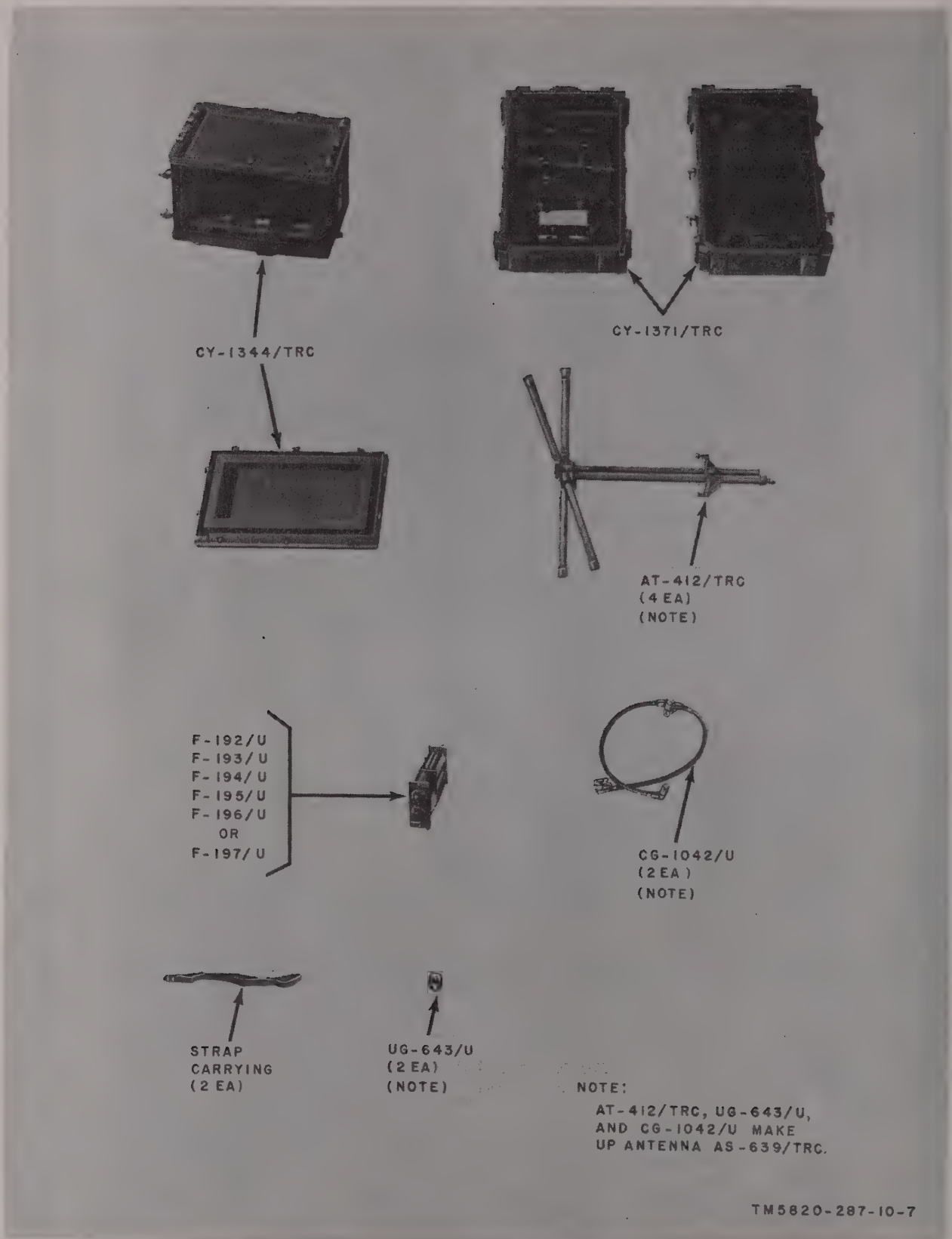



*Figure 7. Antenna-Filter Group OA–1393/GRC.*

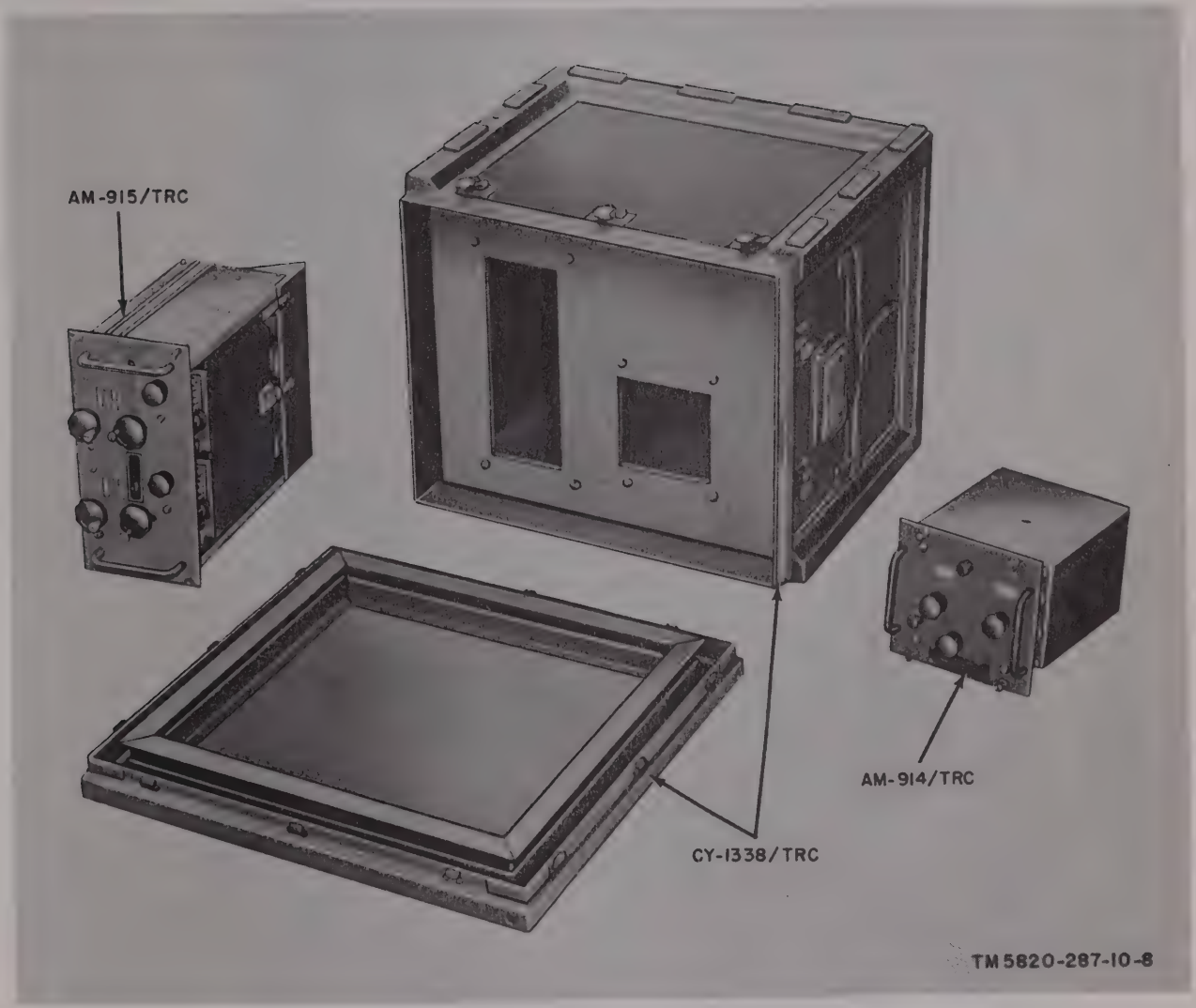



*Figure 8. Amplifier Group OA–1394/GRC.*

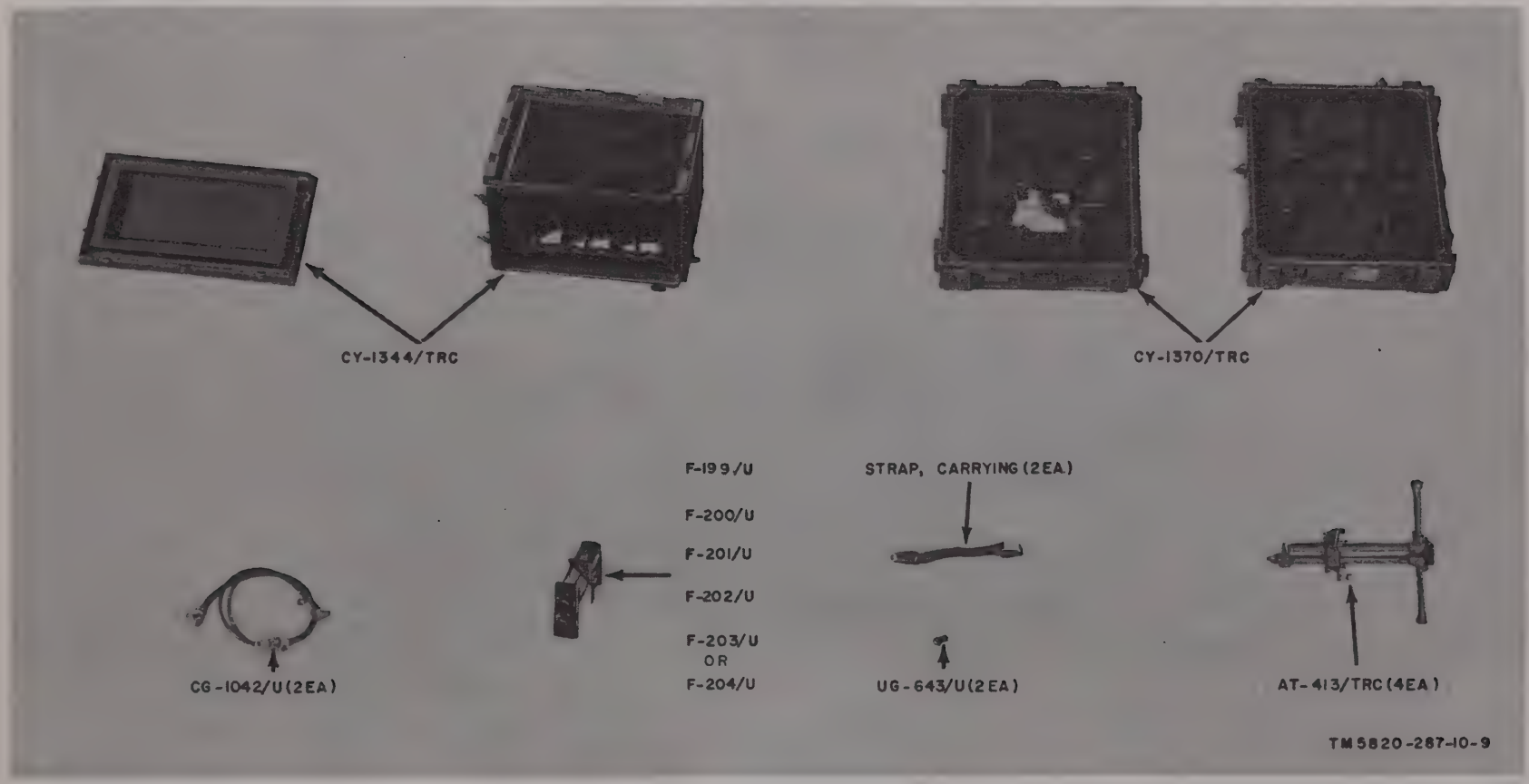



*Figure 9. Antenna-Filter Group OA-1395/GRC.*

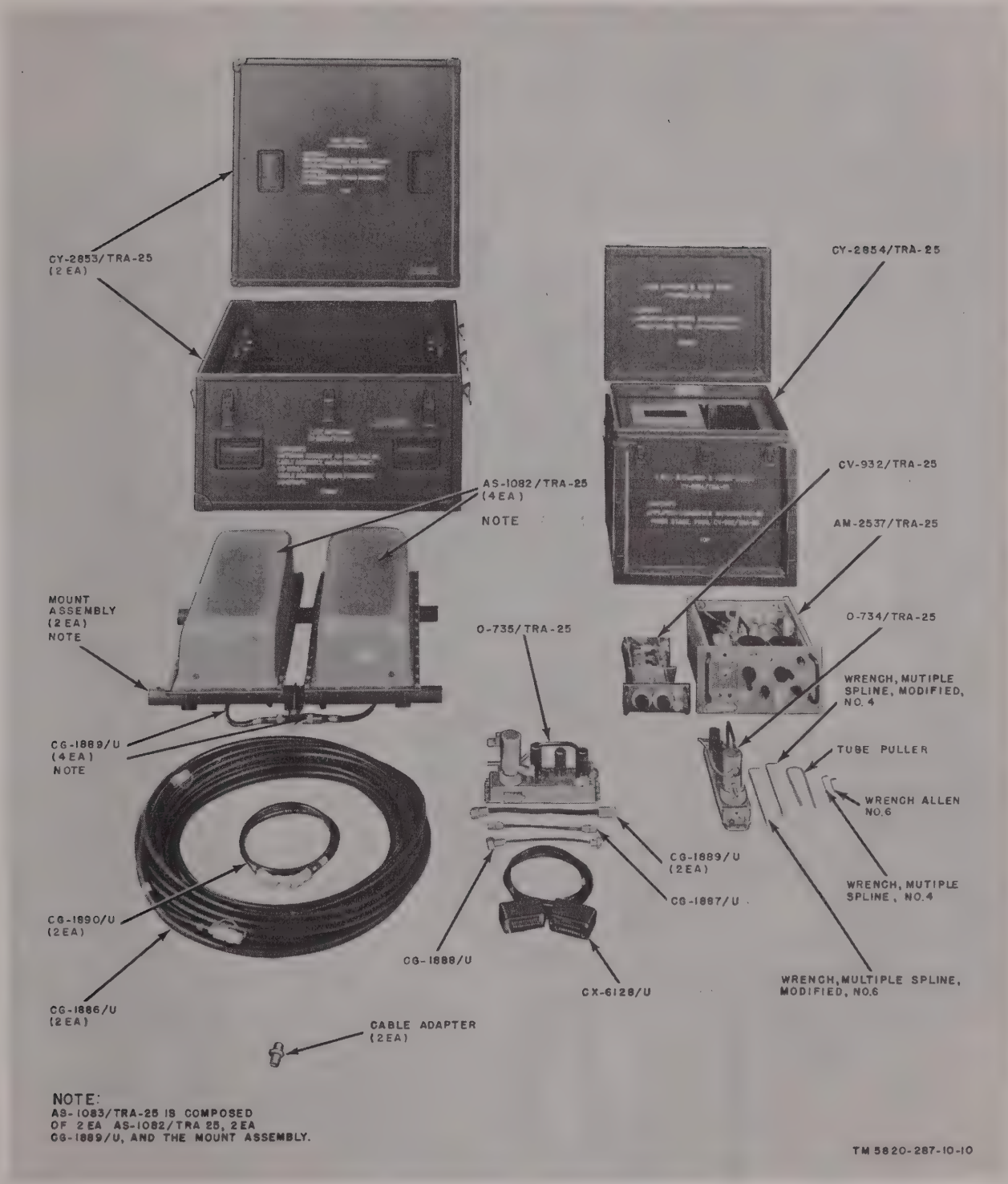



*Figure 10. Radio Set Group AN/TRA-25.*

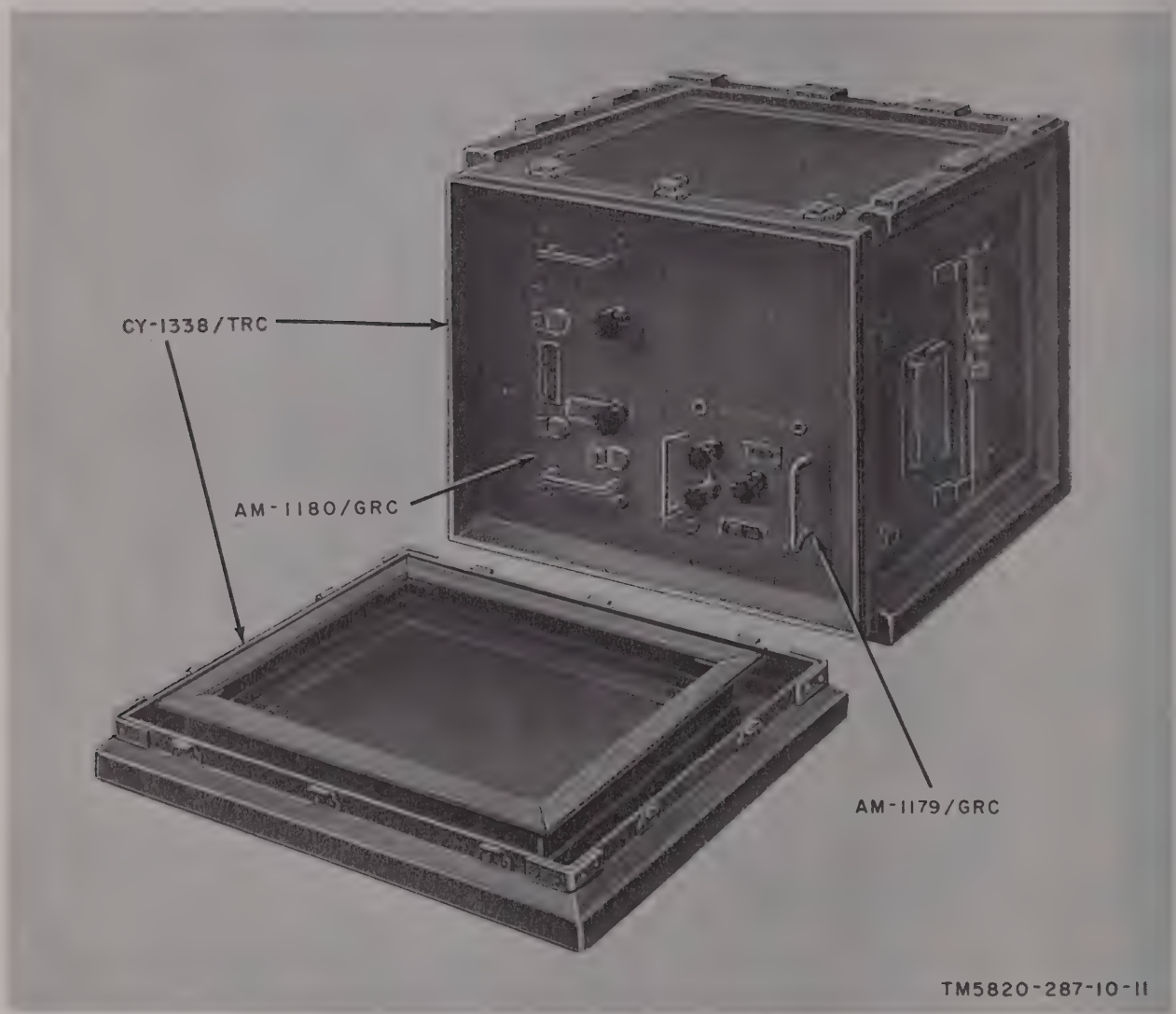



*Figure 11. Amplifier Group OA–1390/GRC.*

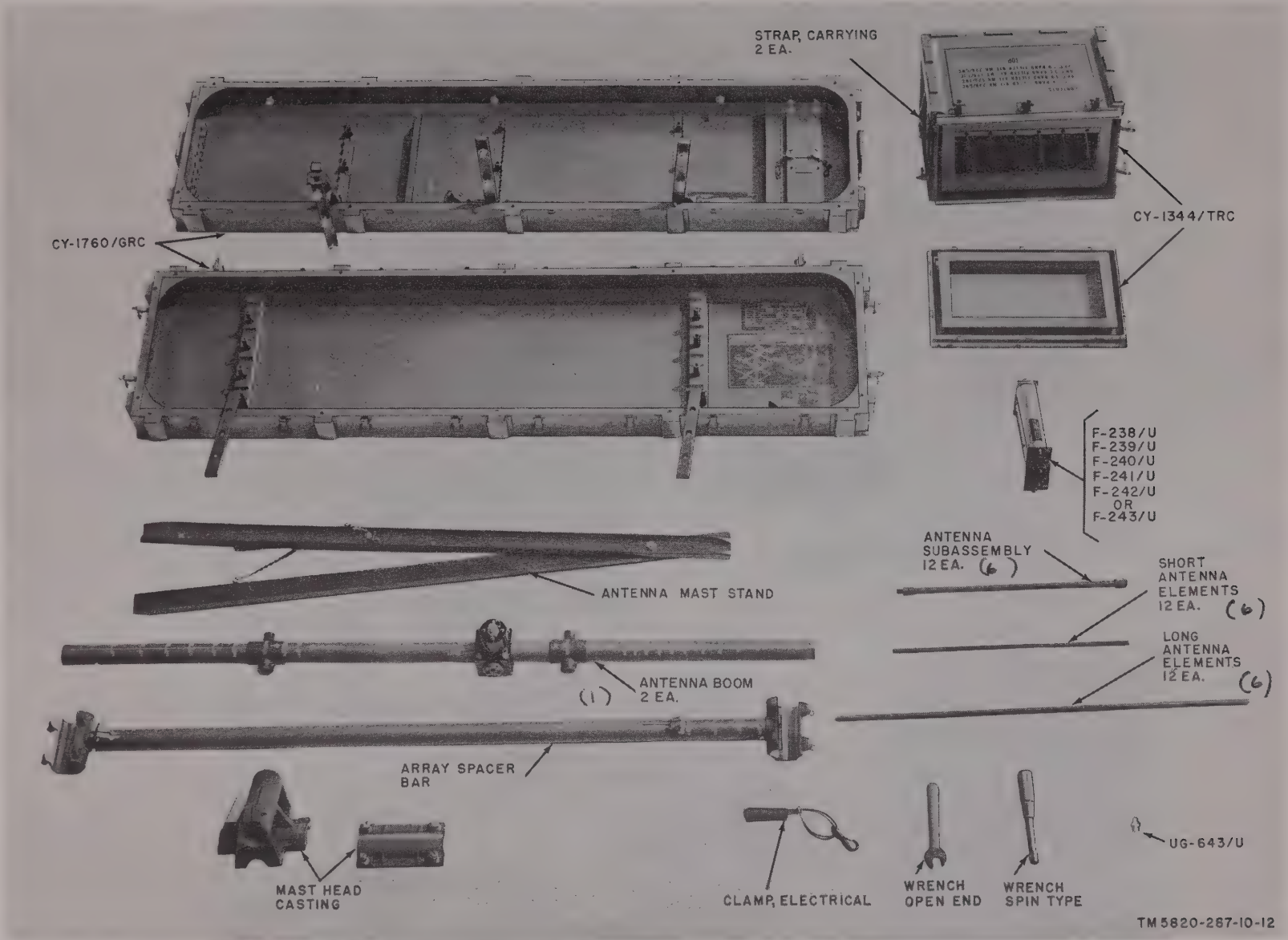



*Figure 12. Antenna Filter Group OA-1391/GRC.*

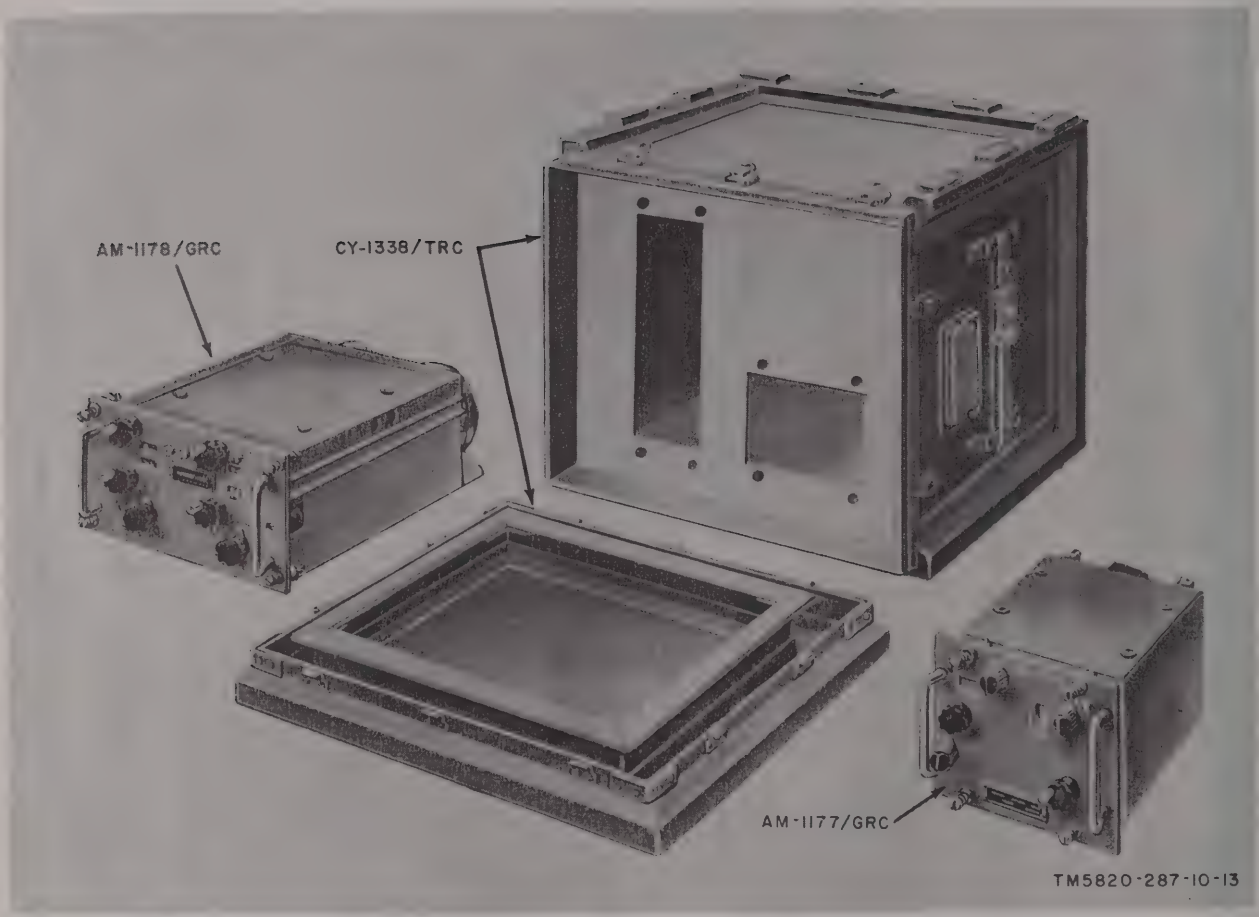



*Figure 13. Amplifier Group OA-1296/GRC.*

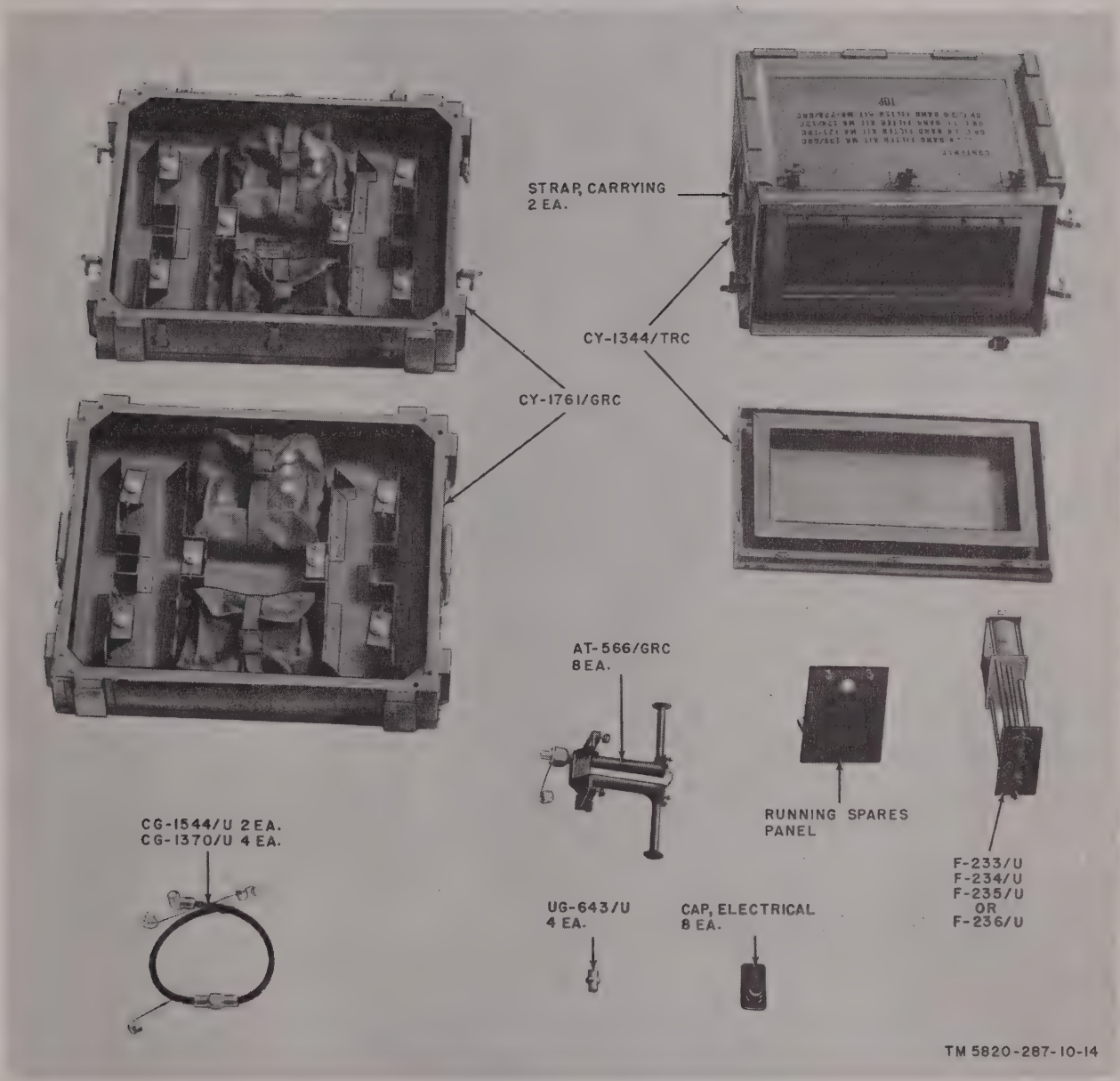



*Figure 14. Antenna Filter Group OA–1397/GRC.*

(2) *Radio terminal set.*

| Nomenclature | Quantity | Components | Fig. No. |
|---|---|---|---|
| Radio Terminal Set AN/TRC–35 | 2 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Group OA–1389/GRC | 4 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 2 | Amplifier Group OA–1392/GRC (B-band) | 6 |
| | 1 | Antenna-Filter Group OA–1393/GRC (B band) | 7 |
| | 2 | Amplifier Group OA–1394/GRC (C-band) | 8 |
| | 1 | Antenna-Filter Group OA–1395/GRC (C-band) | 9 |
| | | *Note.* Radio Set Group AN/TRA–25 (F-band) is not a component of the AN/TRC–35, but is used with the AN/TRC–35 (par. 71). | 10 |
| Radio Terminal Set AN/GRC–76 | 2 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 2 | Amplifier Group OA–1390/GRC (A-band) | 11 |
| | 1 | Antenna Filter Group OA–1391/GRC (A-band) | 12 |
| Radio Terminal Set AN/GRC–79 | 2 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Group OA–1389/GRC | 4 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 2 | Amplifier Group OA–1392/GRC (B-band) | 6 |
| | 1 | Antenna-Filter Group OA–1393/GRC (B-band) | 7 |
| | 2 | Amplifier Group OA–1396/GRC (D-band) | 13 |
| | 1 | Antenna Filter Group OA–1397/GRC (D-band) | 14 |
| | | *Note.* Radio Set Group AN/TRA–25 (F-band) is not a component of the AN/GRC–79, but is used with the AN/GRC–79 (par. 71). | 10 |
| Radio Terminal Set AN/GRC–82 | 2 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 1 | Antenna Group OA–1389/GRC | 4 |
| | 1 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 2 | Amplifier Group OA–1394/GRC (C-band) | 8 |
| | 1 | Antenna-Filter Group OA–1395/GRC (C-band) | 9 |

(3) *Radio relay set and radio repeater set.*

| Nomenclature | Quantity | Components | Fig. No. |
|---|---|---|---|
| Radio Relay Set AN/TRC–36 | 3 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 2 | Antenna Group OA–1389/GRC | 4 |
| | 2 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 3 | Amplifier Group OA–1392/GRC (B-band) | 6 |
| | 2 | Antenna-Filter Group OA–1393/GRC (B-band) | 7 |
| | 3 | Amplifier Group OA–1394/GRC (C-band) | 8 |
| | 1 | Antenna-Filter Group OA–1395/GRC (C-band) | 9 |
| | | *Note.* Radio Set Group AN/TRA–25 (F-band) is not a component of the AN/TRC–36, but is used with the AN/TRC–36 (par. 71). | 10 |

| Nomenclature | Quantity | Components | Fig. No. |
|---|---|---|---|
| Radio Repeater Set AN/GRC–77 | 3 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 2 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 3 | Amplifier Group OA–1390/GRC (A-band) | 11 |
| | 2 | Antenna Filter Group OA–1391/GRC (A-band) | 12 |
| Radio Repeater Set AN/GRC–80 | 3 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 2 | Antenna Group OA–1389/GRC | 4 |
| | 2 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 3 | Amplifier Group OA–1392/GRC (B-band) | 6 |
| | 2 | Antenna-Filter Group OA–1393/GRC (B-band) | 7 |
| | 3 | Amplifier Group OA–1396/GRC (D-band) | 13 |
| | 2 | Antenna Filter Group OA–1397/GRC (D-band) | 14 |
| | | *Note.* Radio Set Group AN/TRA–25 is not a component of the AN/GRC–80, but is used with the AN/GRC–80 (par. 71). | 10 |
| Radio Repeater Set AN/GRC–83 | 3 | Radio Set Group OA–1387/GRC | 1 |
| | 1 | Power Accessories Group OA–1676/GRC | 2 |
| | 1 | Generator Set Group OA–1675/GRC | 3 |
| | 2 | Antenna Group OA–1389/GRC | 4 |
| | 2 | Antenna Accessories Group OA–1398/GRC | 5 |
| | 3 | Amplifier Group OA–1394/GRC (C-band) | 8 |
| | 2 | Antenna-Filter Group OA–1395/GRC (C-band) | 9 |

(4) *Component summary chart.*

| Group | Quantity | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | AN/TRC–24 | AN/TRC–35 | AN/TRC–36 | AN/GRC–75 | AN/GRC–76 | AN/GRC–77 | AN/GRC–78 | AN/GRC–79 | AN/GRC–80 | AN/GRC–81 | AN/GRC–82 | AN/GRC–83 |
| OA–1675/GRC | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OA–1676/GRC | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OA–1387/GRC | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| OA–1389/GRC | 1 | 1 | 2 | ------ | ------ | ------ | 1 | 1 | 2 | 1 | 1 | 2 |
| OA–1398/GRC | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 2 |
| OA–1390/GRC (A-band) | ------ | ------ | ------ | 1 | 2 | 3 | ------ | ------ | ------ | ------ | ------ | ------ |
| OA–1391/GRC (A-band) | ------ | ------ | ------ | 1 | 1 | 2 | ------ | ------ | ------ | ------ | ------ | ------ |
| OA–1392/GRC (B-band) | 1 | 2 | 3 | ------ | ------ | ------ | 1 | 2 | 3 | ------ | ------ | ------ |
| OA–1393/GRC (B-band) | 1 | 1 | 2 | ------ | ------ | ------ | 1 | 1 | 2 | ------ | ------ | ------ |
| OA–1394/GRC (C-band) | 1 | 2 | 3 | ------ | ------ | ------ | ------ | ------ | ------ | 1 | 2 | 3 |
| OA–1395/GRC (C-band) | 1 | 1 | 1 | ------ | ------ | ------ | ------ | ------ | ------ | 1 | 1 | 2 |
| OA–1396/GRC (D-band) | ------ | ------ | ------ | ------ | ------ | ------ | 1 | 2 | 3 | ------ | ------ | ------ |
| OA–1397/GRC (D-band) | ------ | ------ | ------ | ------ | ------ | ------ | 1 | 2 | 3 | ------ | ------ | ------ |
| AN/TRA–25[1] (F-band) | 1 | 2 | 3 | ------ | ------ | ------ | 1 | 2 | 3 | ------ | ------ | ------ |

[1] Radio Set Group AN/TRA–25 is not a component of the equipments listed above, but is used with these equipments (par. 71).

*b. Items of Component Groups.*

(1) *Radio Set Group OA–1387/GRC.*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Power Supply PP–685/TRC including: | | | | | |
| | 1 ea Case, Power Supply CY–1340/TRC | 1 | 17½ | 18⅜ | 20⅝ | 115 |
| | or | | | | | |
| 1 | Power Supply PP–685A/TRC including: | | | | | |
| | 1 ea Case, Power Supply CY–1340/TRC | 1 | 17½ | 18⅜ | 20⅝ | 115 |
| 1 | Receiver, Radio R–417/TRC including: | | | | | |
| | 1 ea Case, Receiver CY–1339/TRC | 1 | 17⅛ | 18¼ | 20⅝ | 96½ |
| | 1 ea filter, dummy | 1 | | | | |
| | or | | | | | |
| 1 | Receiver, Radio R–417A/TRC including: | | | | | |
| | 1 ea Case, Receiver CY–1339/TRC | 1 | 17⅛ | 18¼ | 20⅝ | 96½ |
| | 1 ea filter, dummy | 1 | | | | |
| 1 | Transformer, Power, Fixed Auto Transformer TF–167/TRC | 1 | | | | |
| 1 | Transmitter, Radio T–302/TRC including: | | | | | |
| | 1 ea Case, Trnasmitter CY–1341/TRC | 1 | 18½ | 22 | 20⅝ | 120¾ |
| | 1 ea filter, dummy | 1 | | | | |
| | or | | | | | |
| 1 | Transmitter, Radio T–302A/TRC including: | | | | | |
| | 1 ea Case, Transmitter CY–1341/TRC | 1 | 18½ | 22 | 20⅝ | 120¾ |
| | 1 ea filter, dummy | 1 | | | | |
| 1 | Accessory Kit MK–133/TRC including: | 1 and 15 | | | | |
| | 1 ea Case, Accessories CY–1342/TRC | 15 | 18⅝ | 20⅝ | 21½ | 94 |
| | 1 ea Cable Assembly, Power Electrical CX–2253/U (4 ft) | 15 | | | | |
| | 1 ea Cable Assembly, Power Electrical CX–2256/U (8 ft) | 15 | | | | |
| | 1 ea Cable Assembly, Power Electrical CX–2257/U (10 ft) | 15 | | | | |
| | 1 ea Cable Assembly, Power Electrical CX–2258/U (8 ft) | 15 | | | | |
| | 1 ea Cable Assembly, Radio Frequency CG–1031/U | 15 | | | | |
| | 1 ea Cable Assembly, Special Purpose, Electrical CX–2252/U (6 ft.) | 15 | | | | |
| | 1 ea Cable Assembly, Telephone CX–1512/U (12 ft) | 15 | | | | |
| | 1 ea running spares drawer containing: | 15 and 16 | | | | |
| | 1 ea capacitor, fixed 0.1 UF ±5% 200 vdcw | 16 | | | | |
| | 1 ea crystal rectifying unit 1N21B | 16 | | | | |
| | 1 ea crystal rectifying unit 1N69A | 16 | | | | |
| | 1 ea electron tube OA3 | 16 | | | | |
| | 3 ea elctron tube 4X150A | 16 | | | | |
| | 2 ea electron tube 4X150G | 16 | | | | |
| | 2 ea electron tube 5R4WGB | 16 | | | | |
| | 2 ea electron tube 6AN5 | 16 | | | | |
| | 1 ea electron tube 6AV6 | 16 | | | | |
| | 3 ea electron tube 6CB6 | 16 | | | | |
| | 3 ea electron tube 6J4 | 16 | | | | |
| | 1 ea electron tube 836 | 16 | | | | |
| | 3 ea electron tube 5654/6AK5W | 16 | | | | |
| | 3 ea electron tube 5670 | 16 | | | | |
| | 1 ea electron tube 5725/6AS6W | 16 | | | | |
| | 1 ea electron tube 5726/6AL5W | 16 | | | | |
| | 2 ea electron tube 5751 | 16 | | | | |
| | 1 ea electron tube 5933 | 16 | | | | |
| | 4 ea electron tube 5998 | 16 | | | | |
| | 8 ea fuse ½ amp, 250v | 16 | | | | |
| | 8 ea fuse 1 amp, 250v | 16 | | | | |
| | 6 ea fuse 3 amp, 250v | 16 | | | | |
| | 6 ea fuse 5 amp, 250v | 16 | | | | |
| | 6 ea fuse 10 amp, 250v | 16 | | | | |
| | 3 ea incandescent lamp 0.15 amp, 6.3v, 1w | 16 | | | | |
| | 8 ea fuse 20 amp, 250v | 16 | | | | |
| | 1 ea resistor, fixed 130 ohms, 2w | 16 | | | | |

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| | 1 ea Handset H–90/U | 15 | | | | |
| | 1 ea lamp, incandescent 0.417 ampere, 120 volts, 50 watts | 15 | | | | |
| | 1 ea light, extension with incandescent lamp, 120v, 60w | 15 | | | | |
| | 1 ea Screwdriver TL–360/U | 15 | | | | |
| | 2 ea strap, carrying | | | | | |
| | 2 ea technical manual | | | | | |

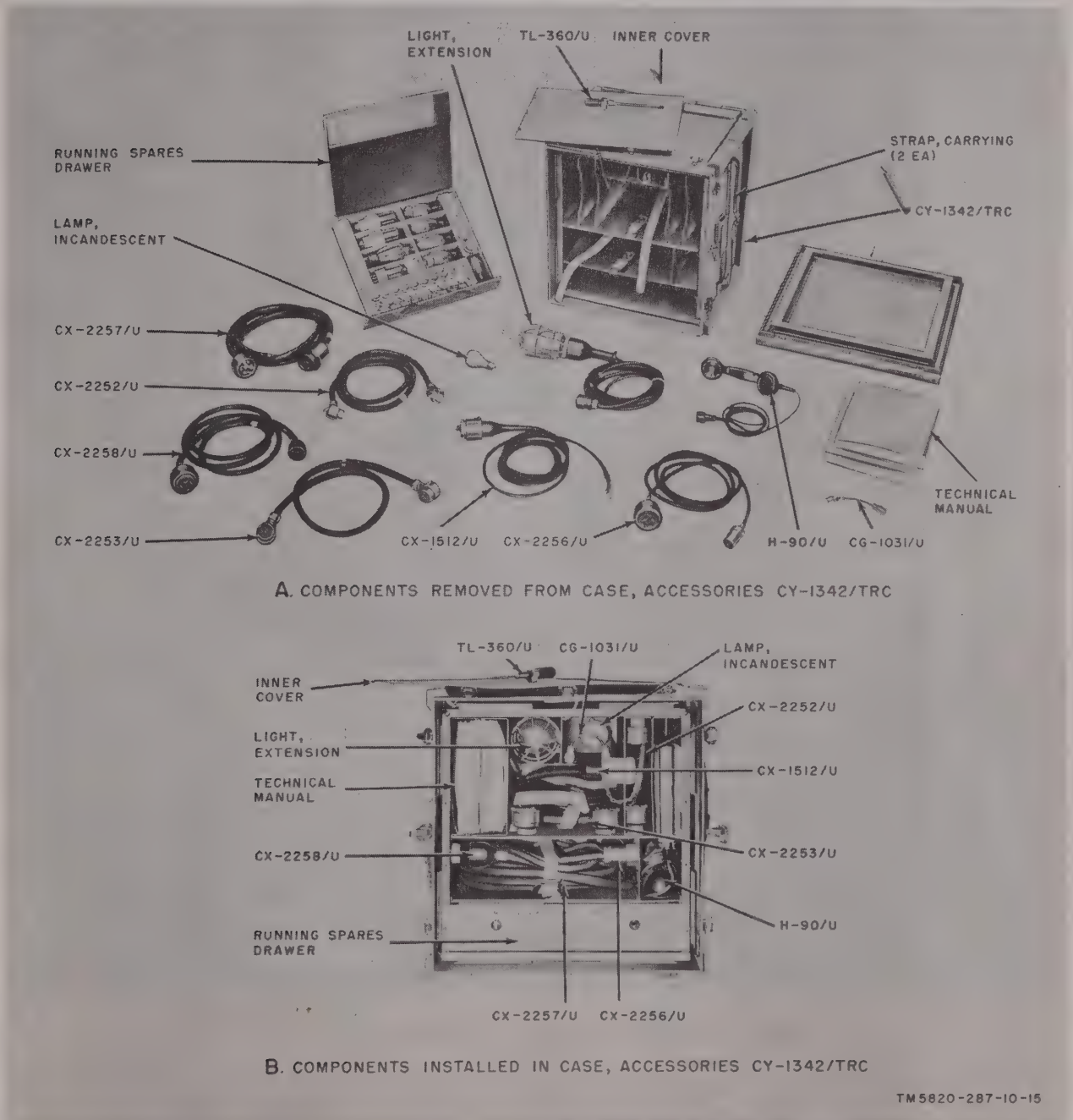



*Figure 15. Accessory Kit MK–133/TRC.*

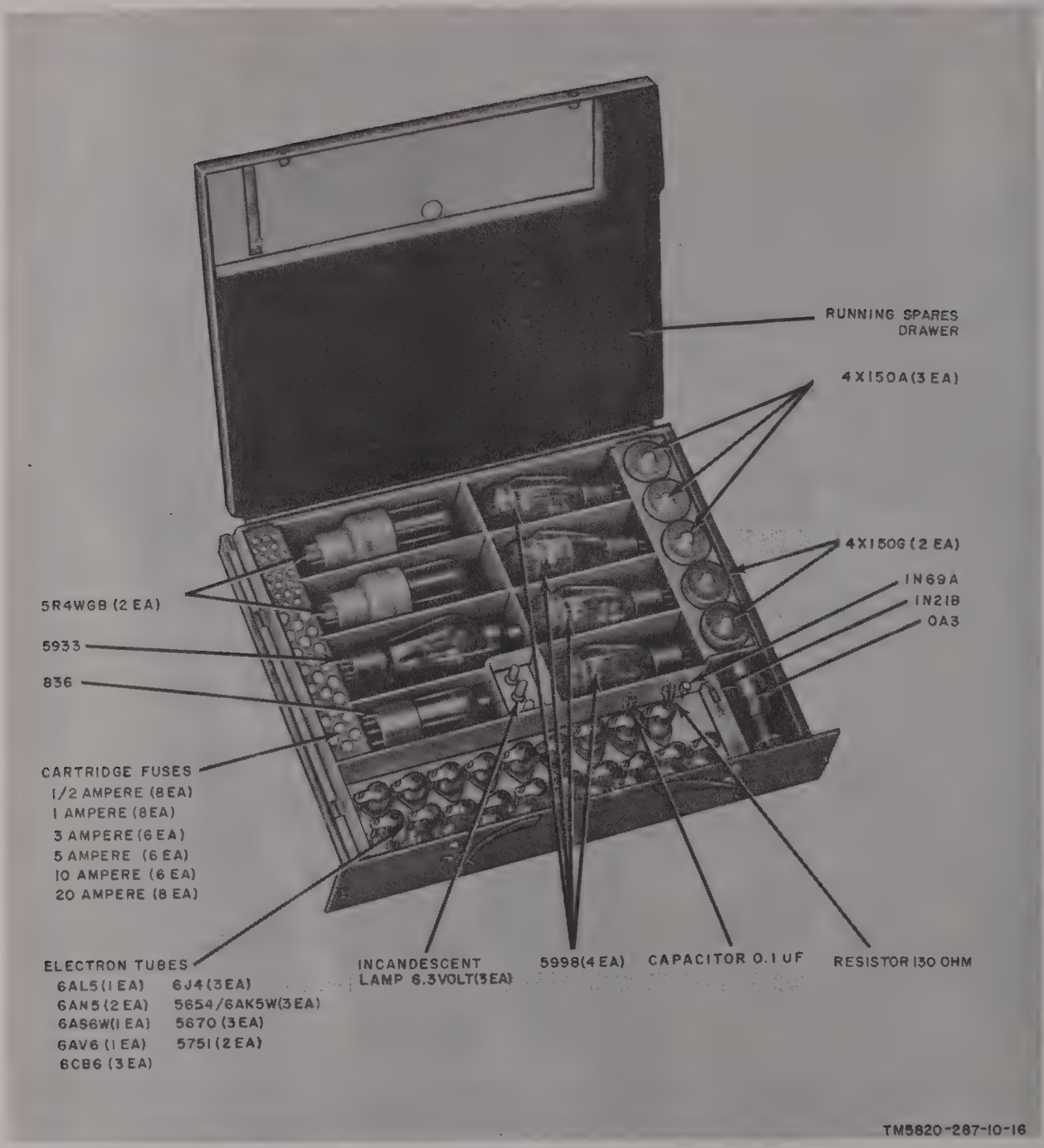



*Figure 16. Running spares drawer of Accessory Kit MK–133/TRC.*

(2) *Generator Set Group OA–1675/GRC.*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Cable Assembly, Power Electrical CX–2251/U (150 ft) | 3 | | | | |
| 2 | Cable Assembly, Power Electrical CX–2254/U (10 ft) | 3 | | | | |
| 5 | Drums, gasoline (5 gal.) | 3 | | | | |
| 1 | Spout, gasoline, flexible | 3 | | | | |
| 1 | Generator Set, Gasoline Engine PU–286/G | 2 | | | | |
| 1 | Ground Rod MX–148/G | 3 | | | | |
| 1 | Reel, Cable RC–405/TR | 3 | | | | |

(3) *Power Accessories Group OA–1676/GRC.*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Accessories CY–1343/TRC containing: | 2 | 18⅝ | 20⅝ | 21½ | 140 |
| | 1 ea Cable Assembly, Radio Frequency CG–718A/U | 2 | | | | |
| | 2 ea Cable Assembly, Special Purpose, Electrical CX–2406/U (30 in.). | 2 | | | | |
| | 1 ea Cable Assembly, Special Purpose, Electrical CX–2420/U (36 in.). | 2 | | | | |
| | 1 ea Cable Assembly, Special Purpose, Electrical CX–2473/U (30 in.). | 2 | | | | |
| | 2 ea Cable Assembly, Radio Frequency CG–789A/U | 2 | | | | |
| | 1 ea Cable Assembly, Radio Frequency CG–1091/U (30 in.) | 2 | | | | |
| | 1 ea Cable Assembly, Radio Frequency CG–1103/U (30 in.) | 2 | | | | |
| | 2 ea strap, carrying | 2 | | | | |
| | 1 ea Interconnecting Box J–532/U | 2 | | | | |
| | 1 ea Screwdriver TL–358/U | 2 | | | | |
| | 1 ea Switch Box SA–331/U | 2 | | | | |
| | 1 ea Wattmeter ME–82/U | 2 | | | | |

(5) *Antenna Accessories Group OA–1398/GRC.*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Accessories CY–1392/G | 5 | 11⅛ | 17¼ | 19⅞ | 126 |
| 1 | Block and tackle | 5 | | | | |
| 2 | Cable Assembly, Radio Frequency CG–1030/U (80 ft) | 5 | | | | |
| 6 | Reel, cable | 5 | | | | |
| 4 | Clamp, electrical | 5 | | | | |
| 2 | Rope, guy | 5 | | | | |
| 1 | Carrying case, guy stake | 5 | | | | |
| 1 | Hammer HM–3 | 5 | | | | |
| 2 | Insulation Tape, Electrical TL–83 | 5 | | | | |
| 2 | Insulation, Tape, Electrical TL–192 | 5 | | | | |
| 3 | Case, mast | 5 | | | | |
| 1 | Cap, gin pole | 5 | | | | |
| 3 | Plate, guy | 5 | | | | |
| 5 | Clamp, guy stake | 5 | | | | |
| 4 | Guy MX–1483/G, (50 ft) | 5 | | | | |
| 4 | Guy MX–1483/G, (58 ft) | 5 | | | | |
| 4 | Guy MX–1484/G, (70 ft) | 5 | | | | |

(4) *Antenna Group OA–1389/GRC.*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Antenna Reflector CY–1385/TRC | 4 | 12½ | 33⅜ | 51¾ | 132 |
| 1 | Case, Antenna Reflector Support CY–1387/TRC | 4 | 6½ | 30 | 33⅝ | 70 |
| 1 | Cradle, antenna mast | 4 | | | | |
| 4 | Shackle, anchor | 4 | | | | |
| 2 | Reel, cable | 4 | | | | |
| 2 | Shackle, chain | 4 | | | | |
| 4 | Clamp, electrical | 4 | | | | |
| 1 | Wrench, open end, fixed (⅞ in.) | 4 | | | | |
| 4 | Guy MK–1483/G (75 ft) | 4 | | | | |
| 2 | Reflector, Antenna AT–414/TRC | 4 | | | | |
| 1 | Handle socket wrench | 4 | | | | |
| 1 | Socket, wrench, common (½ in.) | 4 | | | | |
| 1 | Support, Antenna Reflector AB–325/TRC | 4 | | | | |
| 1 | Wrench, box | 4 | | | | |

(6) *Antenna Accessories Group OA–1398/GRC.*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Base, mast | 5 | | | | |
| 14 | Mast Section AB–332/G | 5 | | | | |
| 5 | Stake, Guy GP–113/G | 5 | | | | |
| 1 | Reel, Cable RC–404/TR | 5 | | | | |
| 12 | Strap, retaining | 5 | | | | |
| 4 | Stake, Ground GP–2 | 5 | | | | |

(7) *Amplifier Group OA–1390/GRC (A-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Standardized Component, Electrical CY–1338/TRC | 11 | 18⅜ | 17⅛ | 20⅝ | 39 |
| 1 | Amplifier-Converter AM–1179/GRC | 11 | | | | |
| 1 | Amplifier, Radio Frequency AM–1180/GRC | 11 | | | | |

(8) *Amplifier Group OA–192/GRC (B-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Standard Components CY–1338/TRC | 6 | 18⅜ | 17⅛ | 20⅝ | 39 |
| 1 | Amplifier-Converter AM–913/TRC | 6 | | | | |
| 1 | Amplifier, Radio Frequency AM–912/TRC | 6 | 6 3/16 | 15 5/16 | 11 15/16 | |
| | or | | | | | |
| 1 | Amplifier, Radio Frequency AM–912/TRC | | 6 3/16 | 15 5/16 | 11 15/16 | |

(9) *Amplifier Group OA–1394/GRC (C-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Standard Components CY–1338/TRC | 8 | 18⅜ | 17⅛ | 20⅝ | 39 |
| 1 | Amplifier-Converter AM–914/TRC | 8 | 6⅜ | 11 | 7³⁄₁₆ | |
| 1 | Amplifier-Multiplier, Radio Frequency AM–915/TRC | 8 | 6³⁄₁₆ | 15⁵⁄₁₆ | 11⁵⁄₁₆ | |
| | or | | | | | |
| 1 | Amplifier-Multiplier, Radio Frequency AM–915A/TRC | | 6³⁄₁₆ | 15⁵⁄₁₆ | 11⁵⁄₁₆ | |

(10) *Amplifier Group OA–1396/GRC (D-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Standardized Components, Electrical CY–1338/TRC | 13 | 18⅜ | 17⅛ | 20⅝ | 39 |
| 1 | Amplifier-Converter AM–1177/GRC | 13 | | | | |
| 1 | Amplifier-Muitiplier Radio Frequency AM–1178/GRC | 13 | | | | |

(11) *Antenna Filter Group OA–1391/GRC (A-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Antenna CY–1760/GRC | 12 | 10 | 19½ | 77½ | 160 |
| 1 | Antenna AS–756/GRC consisting of: | | | | | |
| | 12 ea antenna elements (long) | 12 | | | | |
| | 12 ea antenna elements (short) | 12 | | | | |
| | 12 ea antenna subassembly | 12 | | | | |
| | 2 ea antenna boom | 12 | | | | |
| | 1 ea array spacer bar | 12 | | | | |
| | 2 ea clamp, electrical | 12 | | | | |
| | 2 ea connector, adapter UG–643/U | 12 | | | | |
| | 1 ea mast head casting | 12 | | | | |
| | 1 ea wrench, open end (⅞ in) | 12 | | | | |
| | 1 ea wrench, spin type (⁷⁄₁₆ in.) | 12 | | | | |
| | 1 ea antenna mast stand | 12 | | | | |
| 1 | Filter Kit MK–236/GRC consisting of: | | | | | |
| | 1 ea Case, Accessories CY–1344/TRC | 12 | | | | |
| | 1 ea Filter, Band Pass F–238/U | 12 | | | | |
| | 1 ea Filter, Band Pass F–239/U | 12 | | | | |
| | 1 ea Filter, Band Pass F–240/U | 12 | | | | |
| | 1 ea Filter, Band Pass F–241/U | 12 | | | | |
| | 1 ea Filter, Band Pass F–242/U | 12 | | | | |
| | 1 ea Filter, Band Pass F–243/U | 12 | | | | |

(12) *Antenna-Filter Group OA–1393/GRC (B-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Antenna CY–1371/TRC | 7 | 9½ | 17 | 29 | 92 |
| 1 | Antenna AS–639/TRC consisting of: | | | | | |
| | 4 ea Antenna Dipole AT–412/TRC | 7 | | | | |
| | 2 ea Connector, Adapter UG–643/U | 7 | | | | |
| | 2 ea Cable Assembly, Radio Frequency CG–1042/U (40 in.) | 7 | | | | |
| 1 | Filter Kit MK–123/TRC consisting of: | | | | | |
| | 1 ea Case, Accessories CY–1344/TRC | 7 | 12¼ | 18¼ | 20¾ | 70 |
| | 1 ea Filter, Band Pass F–192/U | 7 | | | | |
| | 1 ea Filter, Band Pass F–193/U | 7 | | | | |
| | 1 ea Filter, Band Pass F–194/U | 7 | | | | |
| | 1 ea Filter, Band Pass F–195/U | 7 | | | | |
| | 1 ea Filter, Band Pass F–196/U | 7 | | | | |
| | 1 ea Filter, Band Pass F–197/U | 7 | | | | |
| | 2 ea strap, carrying | 7 | | | | |

(13) *Antenna-Filter Group OA–1395/GRC (C-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Antenna CY–1370/TRC | 9 | 9½ | 21⅜ | 24⅞ | 66 |
| 1 | Antenna AS–640/TRC consisting of: | | | | | |
| | 4 ea Antenna Dipole AT–413/TRC | 9 | | | | |
| | 2 ea Cable Assembly, Radio Frequency CG–1042/U (40 in.) | 9 | | | | |
| | 2 ea Connector, Adapter UG–643/U | 9 | | | | |
| 1 | Filter Kit MK–124/TRC consisting of: | | | | | |
| | 1 ea Case, Accessories CY–1344/TRC | 9 | 12¼ | 18¼ | 20¾ | 70 |
| | 1 ea Filter Band Pass F–199/U | 9 | | | | |
| | 1 ea Filter Band Pass F–200/U | 9 | | | | |
| | 1 ea Filter Band Pass F–201/U | 9 | | | | |
| | 1 ea Filter Band Pass F–202/U | 9 | | | | |
| | 1 ea Filter Band Pass F–203/U | 9 | | | | |
| | 1 ea Filter Band Pass F–204/U | 9 | | | | |
| | 2 ea strip, carrying | 9 | | | | |

(14) *Antenna Filter Group OA–1397/GRC (D-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Antenna CY–1761/GRC | 14 | 10 | 20 | 25½ | 92 |
| 4 | Adapter, Connector UG–643/U | 14 | | | | |
| 1 | Antenna AS–655/GRC consisting of: | | | | | |
| | 8 ea Antenna Element AT–566/GRC | 14 | | | | |
| | 2 ea Cable Assembly, Radio Frequency GC–1544/U (26 in.) | 14 | | | | |
| | 4 ea Cable Assembly, Radio Frequency GC–1370/U (40 in.) | 14 | | | | |
| | 8 ea cap, electrical | 14 | | | | |
| 1 | Filter Kit MK–228/GRC consisting of: | | | | | |
| | 1 ea Case, Accessories CY–1344/TRC | 14 | 12¼ | 18¼ | 20¼ | 60 |
| | 1 ea Filter, Band pass F–233/U | 14 | | | | |

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| | 1 ea Filter, Band Pass F–234/U | 14 | | | | |
| | 1 ea Filter, Band Pass F–235/U | 14 | | | | |
| | 1 ea Filter, Band Pass F–236/U | 14 | | | | |
| | 1 ea running spares panel | 14 | | | | |
| | 2 ea strap, carrying | 14 | | | | |

(15) *Radio Set Group AN/TRA–25 (F-band).*

| Quantity | Item | Figure No. | Dimensions (in.) | | | Unit weight (lb) |
|---|---|---|---|---|---|---|
| | | | Height | Depth | Width | |
| 1 | Case, Amplifier and Mixer Stage CY–2854/TRA–25 containing: | 10 | 18 3/8 | 17 1/2 | 20 5/8 | 22 |
| | 1 ea Mixer Stage, Frequency CV–932/TRA–25 | 10 | 2 1/2 | 6 1/8 | 11 1/2 | 7 |
| | 1 ea Oscillator-Multiplier O–734/TRA–25* | 10 | | | | |
| | 1 ea Oscillator-Multiplier O–735/TRA–25* | 10 | | | | |
| | 1 ea Amplifier-Converter AM–2537/TRA–25 containing:* | 10 | 6 3/16 | 15 5/16 | 11 15/16 | 25 |
| | 1 ea Cable Assembly, Radio Frequency CG–1887/U | 10 | | 9 | | |
| | 1 ea Cable Assembly, Radio Frequency CG–1888/U | 10 | | 12 | | |
| | 1 ea tube puller | 10 | | | | |
| | 1 ea wrench, Allen, No. 6 | 10 | | | | |
| | 1 ea wrench, multiple spline, No. 4 | 10 | | | | |
| | 1 ea wrench, multiple spline (modified) No. 4 | 10 | | | | |
| | 1 ea wrench, multiple spline (modified) No. 6 | 10 | | | | |
| | 1 ea cable adapter | 10 | | | | |
| | 1 ea Cable Assembly, Special Purpose Electrical CX–6128/U (68 in.). | 10 | | 65 | | |
| 2 | Case, Antenna CY–2853/TRA–25 containing: | 10 | 12 | 34 | 34 | |
| | 1 ea Antenna Assembly AN–1083/TRA–25 including: | | | | | |
| | 2 ea Antenna AS–1082/TRA–25 | 10 | | | | |
| | 2 ea Cable Assembly, Radio Frequency CG–1889/U | 10 | | | | |
| | 1 ea Mount Assembly | 10 | | | | |
| | 1 ea Cable Assembly, Radio Frequency CG–1886/U (80 ft) | 10 | | | | |
| | 1 ea Cable Assembly, Radio Frequency CG–1890/U (51 in.) | 10 | | | | |

*O–734/TRA–25 or O–735/TRA–25 is contained within AM–2537/TRA–25 for shipment.

*c. Running Spares.*

| Nomenclature | Quantity | Components | Fig. No. |
|---|---|---|---|
| Power Supply PP–685/TRC | 1 | Thermal relay | 17 |
| or | | | |
| Power Supply PP–685A/TRC | | | |
| Generator Set Group OA–1675/GRC | 5 | Drum, gasoline (gal.) | 3 |
| | 1 | Generator Set, Gasoline Engine PU–286/G | 3 |
| | 1 | Ground Rod MK–148/G | 3 |
| | 1 | Spout, gasoline, flexible | 3 |
| Power Accessories Group OA–1676/GRC. | 12 | Catridge fuse, 10 amp 250v for J–532/U | 16 |
| | 2 | Crystal rectifying unit 1N21B for ME–82/U | 16 |
| Antenna Group OA–1389/GRC | 2 | Clamp, electrical | 4 |
| Antenna Accessories Group OA–1398/GRC. | 2 | Cable Assembly, Radio Frequency CG–1030/U, (80 ft) | 5 |
| | 3 | Hammer handle, 32 in length, for HM–3 | 5 |
| | 1 | Reel, Cable RC–404/TR | 5 |

| Nomenclature | Quantity | Components | Fig. No. |
|---|---|---|---|
| | 1 | Reel, cable | 5 |
| | 1 | Guy MX–1484/G (70 ft) | 5 |
| | 2 | Plate, guy | 5 |
| | 1 | Mast Section AB–332/G | 5 |
| Amplifier Group OA–1390/GRC (A-band). | 1 | Electron tube 6J4 | 16 |
| | 1 | Electron tube 5670 | 16 |
| | 1 | Electron tube 5654/6AK5W | 16 |
| | 1 | Electron tube 4X150A for AM–1180/GRC | 16 |
| Antenna Filter Group OA–1391/GRC (A-band). | 6 | Antenna elements (long) for AS–756/GRC | 12 |
| | 6 | Antenna elements (short) for AS–756/GRC | 12 |
| | 6 | Antenna subassembly for AS–756/GRC | 12 |
| Amplifier Group OA–1392/GRC (B–band) | 1 | Electron tube 4X150A for AM–912/TRC or AM–912/TRC | 16 |
| | 1 | Electron tube 5670 for AM–913/TRC | 16 |
| | 1 | Electron tube 6J4 for AM–913/TRC | 16 |
| Antenna-Filter Group OA–1393/GRC (B-band). | 2 | Antenna Dipole AT–412/TRC for AS–639/TRC | 7 |
| Amplifier Group OA–1394/GRC (C-band). | 1 | Electron tube 5670 for AM–914/TRC | 16 |
| | 2 | Electron tube 6J4 for AM–914/TRC | 16 |
| | 1 | Electron tube 4X150A for AM–91500/TRC | 16 |
| | 1 | Electron tube 4X150G for AM–915(*)/TRC | 16 |
| Antenna-Filter Group OA–1395/GRC (C-band). | 2 | Antenna Diploe AT–413/TRC for AS–640/TRC | 9 |
| | 1 | Electron tube 5768 for AM–1177/GRC | 17 |
| | 1 | Electron tube 6AF4A for AM–1177/GRC | 17 |
| Amplifier Group OA–1396/GRC (D-band). | 1 | Electron tube 6AN4 for AM–1177/GRC | 17 |
| | 1 | Crystal rectifier 1N457 for AM–1178/GRC | 17 |
| | 1 | Electron tube 4X150A for AM–1178/GRC | 16 |
| | 1 | Electron tube 4X150G for AM–1178/GRC | 16 |
| | 4 | Antenna Element AT–566/GRC for AS–755/GRC | 14 |
| Antenna-Filter Group OA–1397/GRC (D-band). | 2 | Cable Assembly, Radio Frequency CG–1544/U for AS–755/GRC | 14 |
| | 2 | Cable Assembly, Radio Frequency CG–1370/U for: AS–755/GRC | 14 |
| | 4 | Cap, electrical for AS–755/GRC | 14 |
| | 3 | Electron tube 5876 | 18 |
| | 2 | Electron tube 6939 | 18 |
| | 2 | Electron tube 12AT7WA | 18 |
| | 1 | Electron tube 3CX100A5 | 18 |
| Radio Set Group AN/TRA–25 | 5 | Cartridge fuse, 3/10 ampere | 18 |
| | 1 | Antenna AS–1083/TRA–25 | 10 |
| | 1 | Crystal CR–51/U (38.347220 mc) | 18 |
| | 1 | Crystal CR–51/U (41.412500 mc) | 18 |
| | 1 | Crystal 1N21ER | 18 |

## 6. Description

The radio equipment sets covered in this manual (par. 1) consists of a specified quantity of separately packaged components (par. 5). Transit cases used to house some of these components are similar. Other cases differ as required for their particular use. The components used to form the various sets are shown in figures 1 through 15. When a set is arranged for operation, the transit cases containing the components may be stacked as convenient for the particular application. In some applications, some components of the set may be removed from the cases and installed in specially fabricated mountings.

## 7. Application

A radio section (par. 3) includes two radio terminals and may or may not include one or more radio repeaters. Many factors determine the range between terminals and repeaters. The nature of

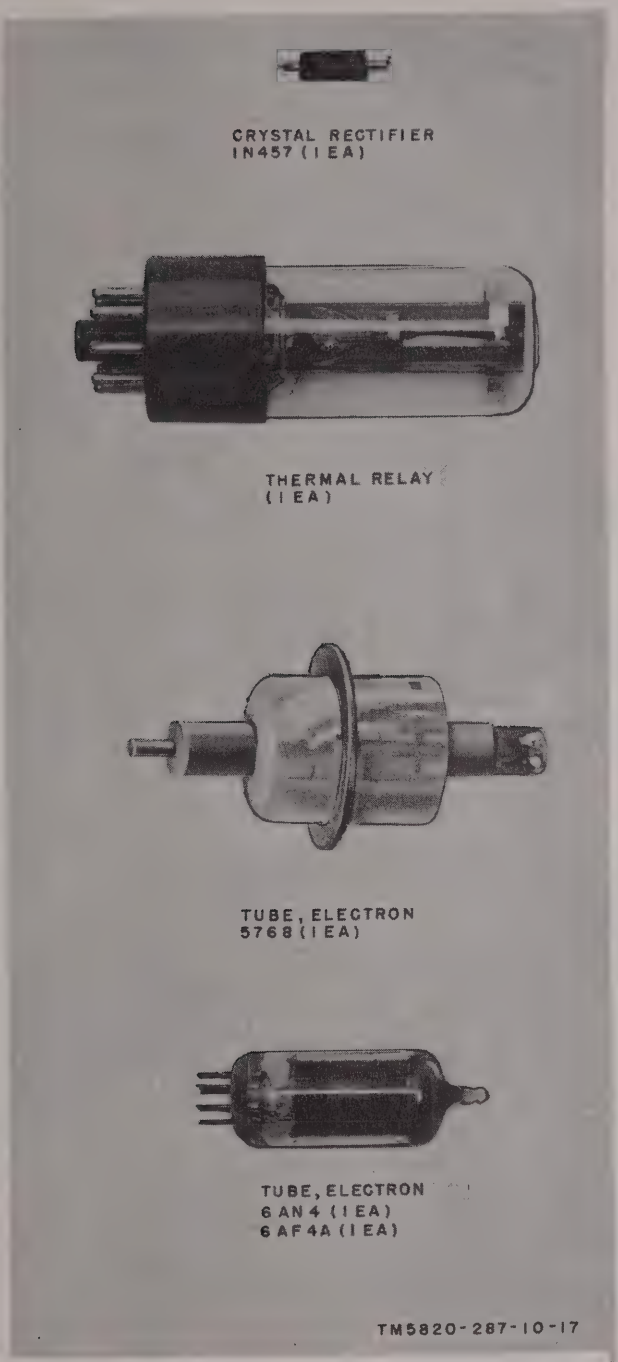



*Figure 17. Thermal relay, crystal rectifier 1N457, and electron tubes 5768 and 6AF4A.*

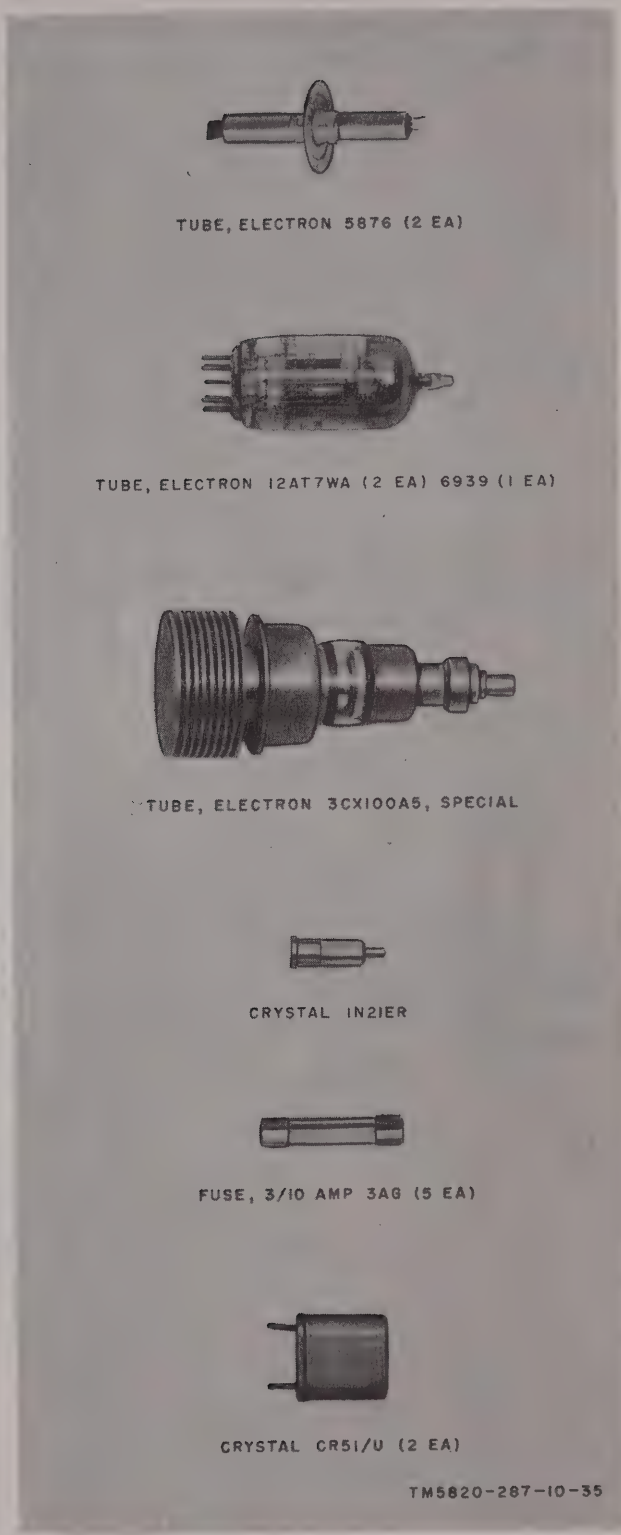

TUBE, ELECTRON 5876 (2 EA)
TUBE, ELECTRON 12AT7WA (2 EA) 6939 (1 EA)
TUBE, ELECTRON 3CX100A5, SPECIAL
CRYSTAL 1N21ER
FUSE, 3/10 AMP 3AG (5 EA)
CRYSTAL CR51/U (2 EA)
TM5820-287-10-35

*Figure 18. Radio Set Group AN/TRA-25 running spares less antenna AS-1083/TRA-25.*

the terrain, the frequency band employed, the height of the antennas, and the atmospheric conditions are some of the factors. Information on radio system planning and layout is contained in TM 11–486–6. Under normal conditions, a range of approximately 30 miles between sets can be considered average (A, fig. 19). When the A and B sections of the radio repeater are located more than

a mile apart, carrier repeaters (A, fig. 20) must be used to overcome possible excessive signal attenuation. When it is necessary to use a radio repeater as a dropoff, carrier terminals (B, fig. 20) must be located between the two sections of the radio repeater.

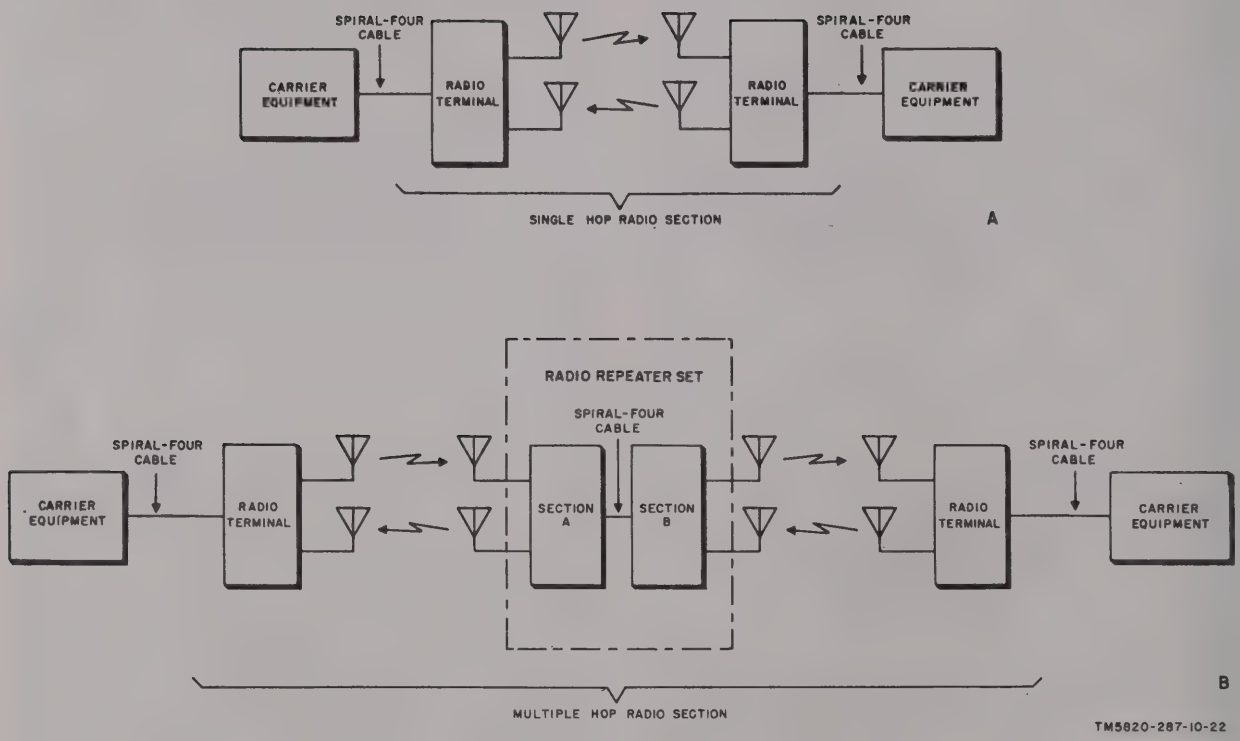



*Figure 19. Typical radio section application in carrier system.*

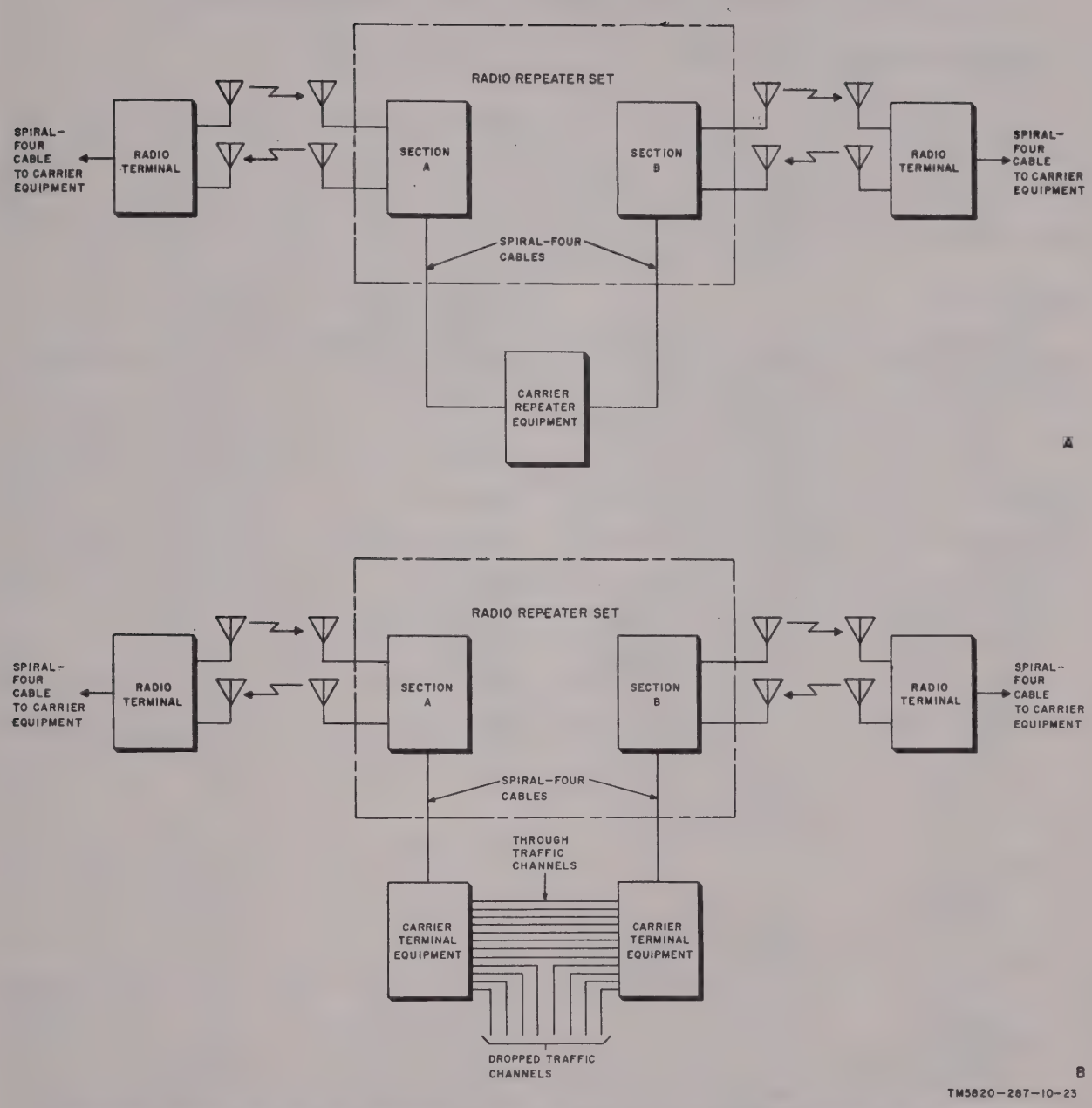



*Figure 20. Typical radio section applications in carrier system with carrier equipment between radio repeater sets.*

# CHAPTER 2

# CONTROLS AND INDICATORS

## Section I. TRANSMITTER, RECEIVER, AND POWER EQUIPMENT

### 8. Transmitter, Radio T–302(*)/TRC
(fig. 21)

| Control or indicator | Function |
|---|---|
| INPUT ADJ control | Controls level of incoming signal to transmitter. |
| MEASURE meter | Indicates level of each signal selected by MEASURE switch. |
| MEASURE switch | |
| *Switch position* | *Circuit connected* |
| RF CHAN TUNE | RF channel signal. |
| 1 KC ADJ | 1 kc oscillator signal. |
| MTR CAL | 1 kc oscillator signal from calibration circuit. |
| DISCR RF DRIVE | RF channel signal from discriminator. |
| 1 KC IN | 1 kc test signal from carrier equipment. |
| 68 KC IN | 68 kc test signal from carrier equipment. |
| MOD 1 KC IN | 1 kc carrier equipment test signal from discriminator. |
| MOD 68 KC IN | 68 kc carrier equipment test signal from discriminator. |
| MOD ADJ | 1 kc oscillator signal from discriminator. |
| MTR SENS switch | When operated to INCR position, increases sensitivity of MEASURE meter circuit when MEASURE switch if in MOD ADJ position. |
| AFC switch | |
| *Position* | *Action* |
| ON | Applies power to automatic frequency control system. |
| OFF | Disconnects power from automatic frequency control system. |
| PULSED OSC switch | |
| *Position* | *Action* |
| ODD CHANNELS | Connects odd channel dial to indicate RF channel number. |
| EVEN CHANNELS | Connects even channel dial to indicate RF channel number. |
| Odd channel dial | Indicates RF channel number when PULSED OSC switch is in ODD CHANNELS. |
| Even channel dial | Indicates RF channel number when PULSED OSC switch is in EVEN CHANNELS. |
| XTAL SEL switch | Connects indicated valve crystal in crystal oscillator |
| *Switch position* | *Crystal connected* |
| DECADE CHANS | 2.5 mc. |
| UNIT CHANS | 1 mc. |
| DISCR CENTER | 10.125 mc. |
| 1 KC ADJ control | Adjusts level of 1-kc oscillator signal. |
| MTR CAL control | Adjusts calibration circuit to 1-kc oscillator signal. |
| DISCR RF DRIVE control | Adjust level of RF channel signal from discriminator. |
| MOD ADJ control | Adjusts level of 1-kc oscillator from discriminator. |
| DISCR CENTER control | Adjusts discriminator to RF-channel signal frequency. |
| TUNE control | Adjusts frequency of pulsed oscillator. |
| RF CHANNEL TUNE control. | Adjusts frequency of base RF oscillator. |
| RF CHANNEL dial | Indicates desired RF channel number. |
| INDEX control | Adjusts index line of RF CHANNEL dial. |
| MOD TRIM control | Adjusts reactance modulator to RF channel frequency. |
| LOCK control | Secures RF CHANNEL TUNE control in fixed position. |
| AFC control | Permits manual correction of automatic frequency control system. |
| DRIVER OUTPUT COUPLING control. | Adjusts coupling between driver and RF tuners. |
| DRIVER TUNE control | Adjusts RF channel frequency. |
| DRIVER CHANNEL dial | Indicates desired RF channel number for A–band on white scale, and in B-, C-, D-, and F-bands on black scale. |
| TEST meter | Indicates magnitude of current for each circuit selected by TEST switch. |
| TEST switch | Connects TEST meter to circuits indicated. |

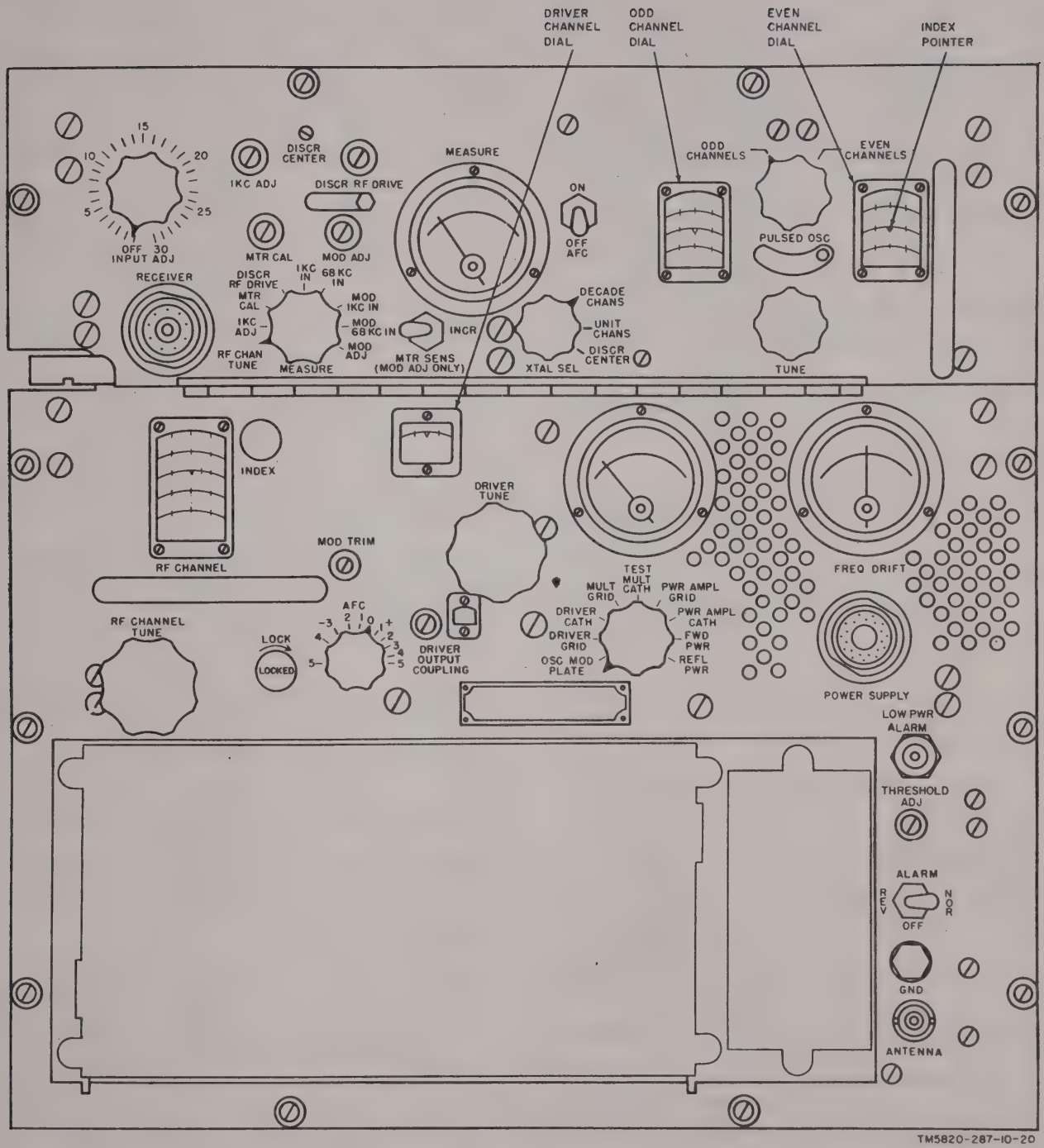



*Figure 21. Transmitter, Radio T–302/TRC, front panel.*

| Control or indicator | Function |
|---|---|
| *Switch position* | *Circuit connected* |
| OSC MOD PLATE | Base RF oscillator and reactance modulator plate circuits. |
| DRIVER GRID | Driver grid circuit. |
| DRIVER CATH | Driver cathode circuit. |
| MULT GRID | Multiplier grid circuit. |
| MULT CATH | Multiplier cathode circuit. |
| PWR AMPL GRID | Power amplifier grid circuit. |
| PWR AMPL CATH | Power amplifier cathode circuit. |
| FWD PWR | Forward power portion of directional coupler. |
| REFL PWR | Reflected power portion of directional coupler. |
| FREQ DRIFT meter | Indicates magnitude of discriminator output signal. |
| LOW PWR ALARM indicator (red). | Indicatds when RF output is too low. |
| THRESHOLD ADJ control | Adjusts reference level for LOW PWR ALARM indicator. |
| ALARM switch | |
| *Position* | *Action* |
| REV | Connects buzzer to alarm amplifier to indicate an RF output above reference level. |
| OFF | Disconnects buzzer from alarm amplifier. |
| NOR | Connects buzzer to alarm amplifier to indicate an RF output below reference level. |

## 9. Receiver, Radio R–417(*)/TRC

(fig. 22)

| Control or indicator | Function |
|---|---|
| POWER circuit breaker | |
| *Position* | *Action* |
| ON | Applies power to equipment and protects equipment from overload. |
| OFF | Removes power from equipment. |
| POWER indicator (amber) | Indicates when power is applied to equipment. |
| AFC-OFF-CAL switch | |
| *Switch position* | *Action* |
| AFC | Connects power to automatic frequency control motor in amplifier-converter. |
| OFF | Disconnects automatic frequency control circuit and calibration oscillator circuit. |
| CAL | Connects power to calibration oscillator circuit. |
| RING-TALK switch | |
| *Switch position* | *Action* |
| RING | Applies power to 1,600-cps oscillator. |
| TALK | Applies power to order-wire circuits. |
| RING lamp (white) | Indicates when ringing signal is received or transmitted, and when power fails. |
| MEASURE meter | Indicates level of each signal selected by MEASURE switch. |
| MEASURE switch | Connects MEASURE meter to circuit indicated. |
| *Switch position* | *Circuit connected* |
| OSC | Grid circuit of oscillator in amplifier-converter. |
| MIX | Grid circuit of mixer in amplifier-converter. |
| SIG LEV | Automatic gain control circuit. |
| 1ST LIM | Grid circuit of 1st limiter. |
| 2ND LIM | Grid circuit of 2d limiter. |
| AFC BAL | Automatic frequency control circuit. |
| MTR CAL | 1 kc from meter amplifier. |
| 1 KC OUT | 1-kc output from 3d base band amplifier. |
| 68 KC OUT | 68-kc output from 3d base band amplifier. |
| B+ | B+ circuit of power supply. |
| FREQ DRIFT meter | Indicates level of discriminator output. |
| OUTPUT ADJ control | Adjusts input signal to base band amplifier and order-wire circuits. |
| ALARM switch | |
| *Switch position* | *Action* |
| NOR | Connects buzzer across alarm circuit to operate when input signal is below reference level. |
| REV | Connects buzzer across alarm circuit to operate when input signal is above reference level. |
| ALARM lamp (red) | Indicates when input signal is below reference level. |
| SQUELCH control | Eliminates weak signals and noise from output and sets reference level for alarm circuit. |

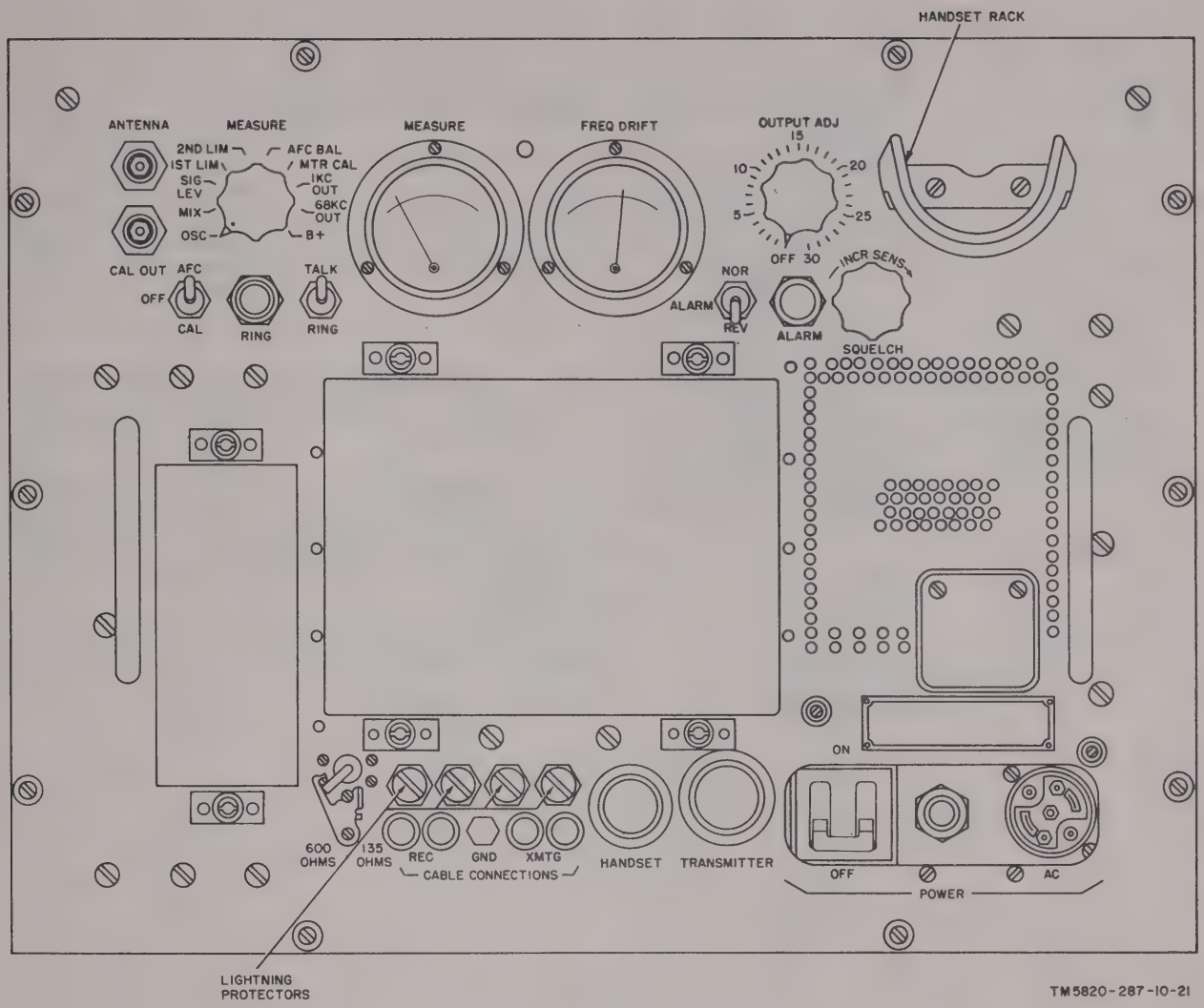



*Figure 22. Receiver, Radio R–417/TRC, front panel.*

| Control or indicator | Function |
|---|---|
| 600 OHMS—135 OHMS switch. | Selects receiver output impednace to match impedance of 600 ohms or 135 ohms load. |

## 10. Power Supply PP–685(*)/TRC

(fig. 23)

| Control or indicator | Function |
|---|---|
| 115V AC circuit breaker | |
| *Position* | *Action* |
| ON | Connects power to equipment and protects from overloads. |
| OFF | Disconnects power from equipment. |
| 150V DC circuit breaker | |
| *Switch Position* | *Action* |
| ON | Connects 150 v dc to TRANSMITTER connector and protects equipment from overloads. |
| OFF | Disconnects 150 v dc from the TRANSMITTER. |
| 750V DC circuit breaker | |
| *Switch Position* | *Action* |
| ON | Connects 750 v dc to TRANSMITTER connector and protects equipment from overloads. |
| OFF | Disconnects 750 v dc from TRANSMITTER. |

| Control or indicator | Function |
|---|---|
| AC VOLTS meter | Indicates voltage applied to equipment. |
| DC VOLTS meter | Indicates voltages to TRANSMITTER connector as selected by DC TEST switch. |
| DC TEST switch | |
| *Switch Position* | *Action* |
| 150 UPPER SCALE | Applies 150 v dc to DC VOLTS meter. |
| 275 LOWER SCALE | Applies 200 to 350 v dc to DC VOLTS meter. |
| 750 LOWER SCALE | Applies 300 to 900 v dc to DC VOLTS meter. |
| 750V ADJ switch | Adjusts output of 750v dc power supply to voltages indicated. |
| *Switch Position* | *Action* |
| 1 | 300 ± 20 v dc. |
| 2 | 650 ± 25 v dc. |
| 3 | 700 ± 30 v dc. |
| 4 | 750 ± 30 v dc. |
| 5 | 800 ± 35 v dc. |
| 6 | 850 ± 35 v dc. |
| 150V DC indicator (amber) | Indicates when power is applied to 150-volt supply. |
| FIL indicator (amber) | Indicates when power is applied to equipment. |
| 750V DC indicator (amber) | Indicates when power is applied to 750-volt supply. |
| 150V ADJ control | Adjusts output of 150-volt supply. |

## 11. Transformer, Power, Fixed Auto Transformer TF–167/TRC and Switch Box SA–331/U

*a. Transformer, Power, Fixed Auto Transformer TF–167/TRC* (A, fig. 24). The INCR OUT switch adjusts the input voltage to 115 ±5.5 vac which is indicated on the AC VOLTS meter of the PP–685/TRC.

*b. Switch Box SA–331/U* (B, fig. 24). The POWER SUPPLY switch selects one of the two sources of ac power.

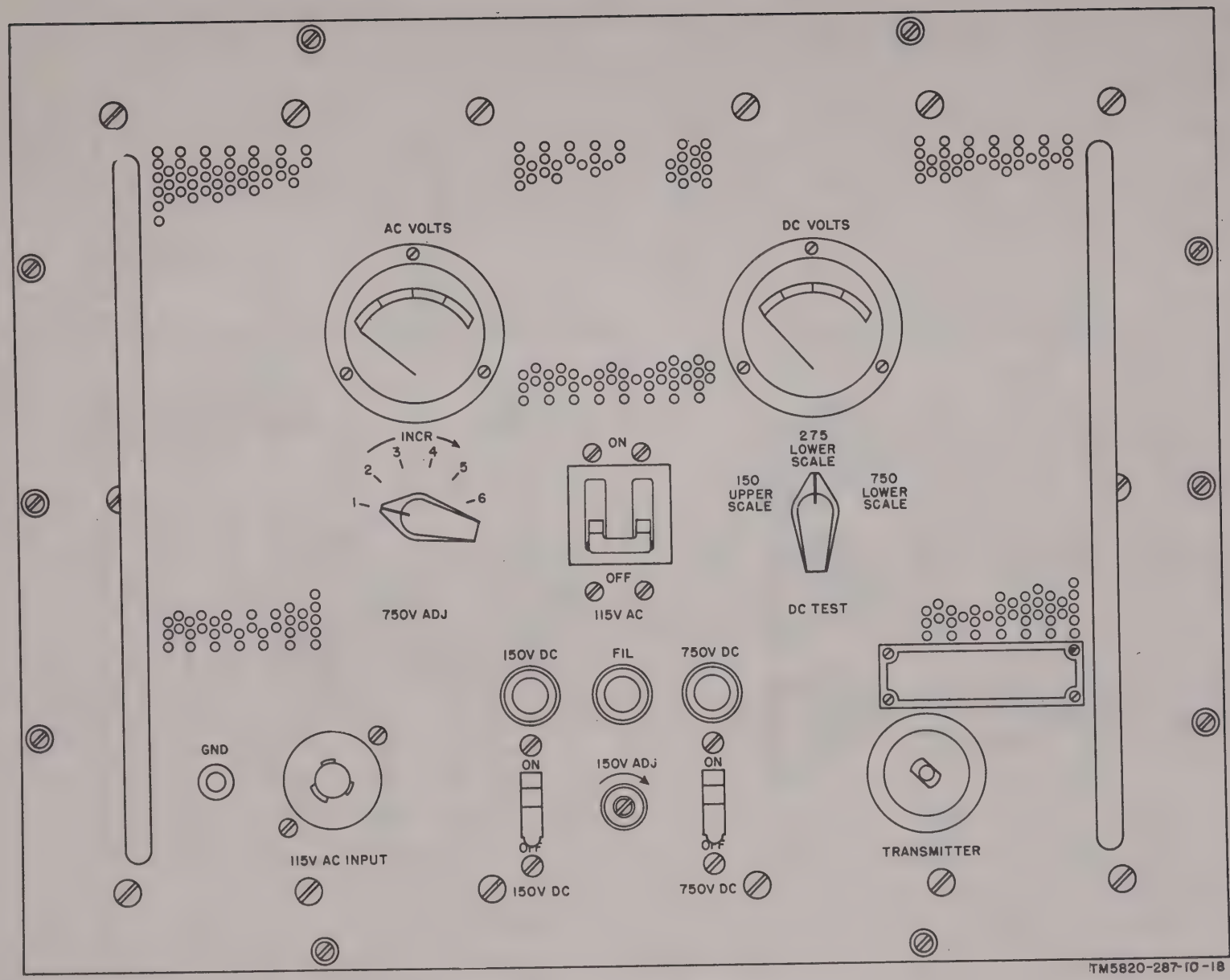
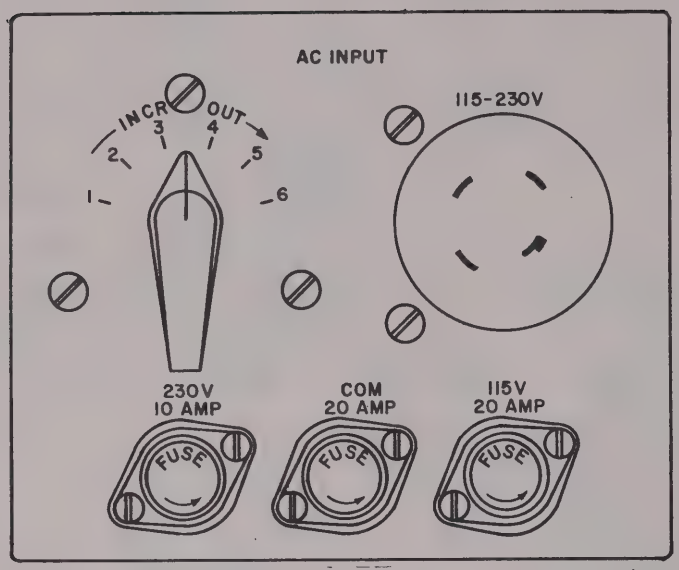
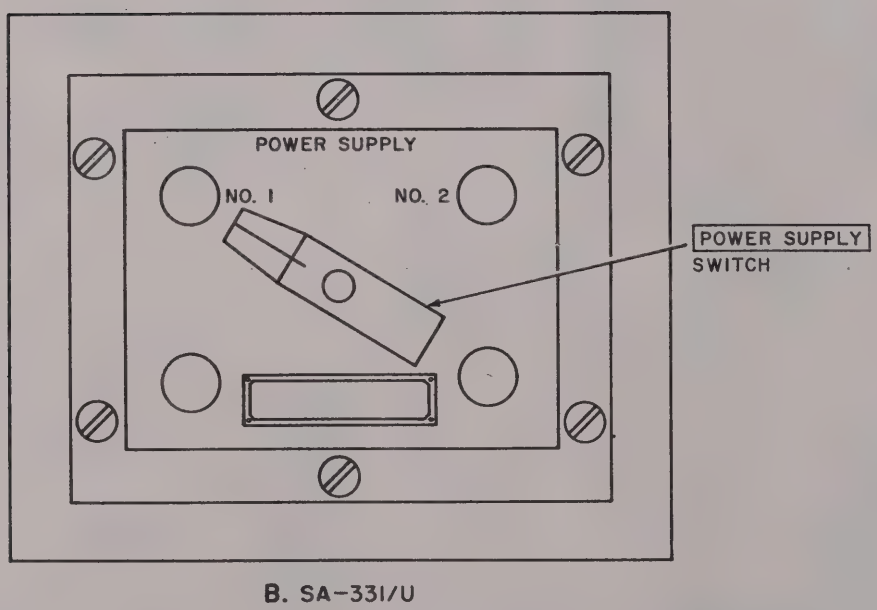



*Figure 23. Power Supply PP–685/TRC, front panel.*




A. TF-167/TRC




B. SA-331/U

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*Figure 24. Transformer, Power, Fixed Auto Transformer TF-167/TRC and Switch Box SA-331/U, front panels.*

## 12. Amplifier Radio Frequency AM–1180/GRC (A-Band)

(fig. 25)

| Control or indicator | Function |
|---|---|
| PLATE TUNE control | Tunes plate circuit of power amplifier. |
| Plate tune dial | Indicates RF channel number and approximate position of PLATE TUNE control. |
| INPUT LOADING control | Adjusts effective grid-to-ground resistance of power amplifier. |
| TRACKING ADJ. control | Adjusts frequency tracking of power amplifier. |
| SCREEN VOLTS ADJ. control. | Adjusts screen grid voltage of power amplifier. |
| OUTPUT COUPLING control. | Adjusts output coupling of power amplifier for maximum output power. |

## 13. Amplifier, Radio Frequency AM–912(*)/TRC (B-Band)

(fig. 26)

| Control or indicator | Function |
|---|---|
| GRID control | Tunes grid circuit of tuner power amplifier. |
| GRID dial | Indicates RF channel number and approximate position of GRID control. |
| PLATE control | Tunes plate circuit of tuner power amplifier. |
| PLATE dial | Indicates RF channel uumber ahd approximate position of PLATE control. |
| AMPLIFIER OUTPUT COUPLING control. | Adjusts output coupling of power amplifier. |
| SCREEN VOLTS ADJ control. | Adjusts screen grid voltage of power amplifier. |

## 14. Amplifier-Multiplier, Radio Frequency AM–915(*)/TRC (C-Band)

(fig. 27)

| Control or indicator | Function |
|---|---|
| Multiplier grid control | Tunes grid circuit of tuner frequency multiplier. |
| MULTIPLIER GRID dial | Indicates RF channel number and approximate position of multiplier grid control. |
| Multiplier plate control | Tunes plate circuit of tuner frequency multiplier. |
| MULTIPLIER PLATE dial | Indicates RF channel number and approximate position of multiplier plate control. |
| MULTIPLIER OUTPUT COUPLING control. | Adjusts coupling between tuner frequency multiplier and tuner power amplifier. |
| Power amplifier grid control | Tunes grid circuit of tuner power amplifier. |

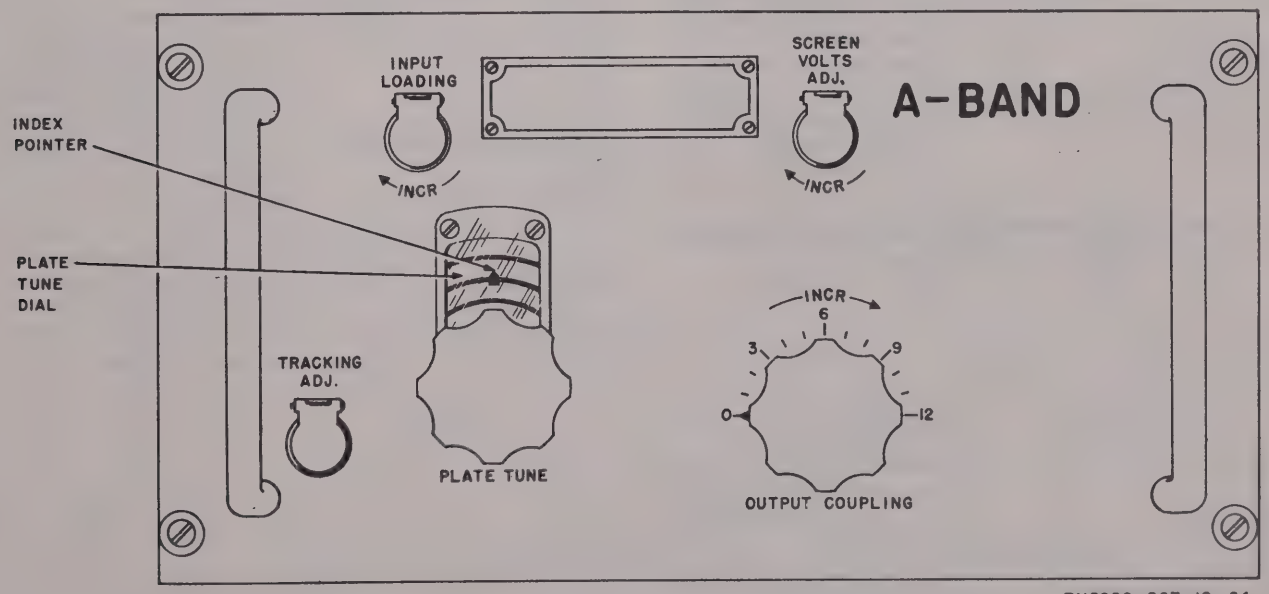


*Figure 25. Amplifier, Radio Frequency AM–1180/GRC, front panel.*

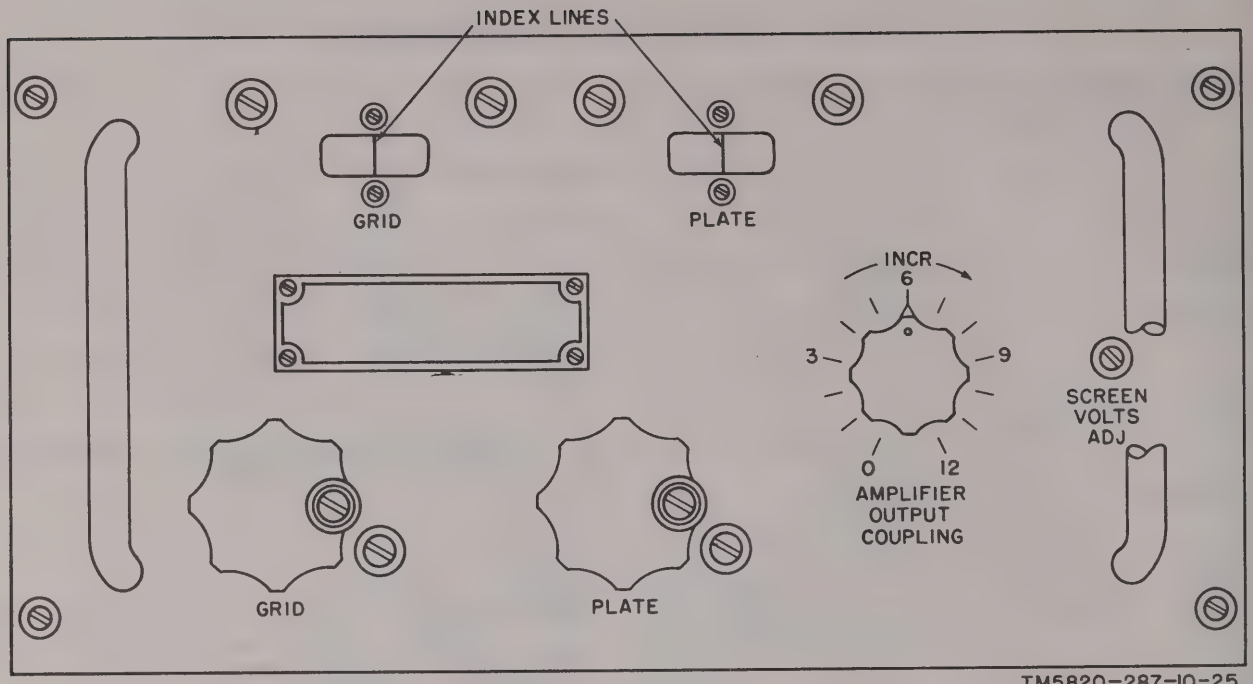


*Figure 26. Amplifier, Radio Frequency AM–912/TRC, front panel.*

| Control or indicator | Function |
|---|---|
| POWER AMPLIFIER GRID dial. | Indicates RF channel number and approximate position of power amplifier grid control. |
| Power amplifier plate control | Tunes plate circuit of tuner power amplifier. |
| POWER AMPLIFIER PLATE dial. | Indicates RF channel number and approximate position of power amplifier plate control. |
| AMPLIFIER OUTPUT COUPLING control. | Adjusts output coupling of tuner power amplifier. |
| SCREEN VOLTS ADJ control. | Adjusts screen grid voltage of power amplifier. |

## 15. Amplifier-Multiplier, Radio Frequency AM–1178/TRC (D-Band)

(fig. 28)

| Control or indicator | Function |
|---|---|
| MULTIPLIER control | Tunes grid circuit of tuner frequency multiplier. |
| GRID dial (left) | Indicates RF channel number and approximate position of MULTIPLIER GRID control. |
| Multiplier plate control | Tunes plate circuit of tuner frequency multiplier. |
| PLATE dial (left) | Indicates RF channel number and approximate position of multiplier plate control. |
| MULTIPLIER OUTPUT COUPLING control. | Adjusts coupling between frequency multiplier and power amplifier. |
| POWER AMPLIFIER control. | Tunes grid circuit of tuner power amplifier. |
| GRID dial (right) | Indicates RF channel number and approximate position of POWER AMPLIFIER GRID control. |
| Power amplifier plate control | Tunes plate circuit of power amplifier. |
| PLATE dial (right) | Indicates RF channel number selected by power amplifier plate control. |
| AMPLIFIER OUTPUT COUPLING control. | Adjusts output coupling of tuner power amplifier. |
| SCREEN VOLTS ADJ control. | Adjusts screen grid voltage of power amplifier. |

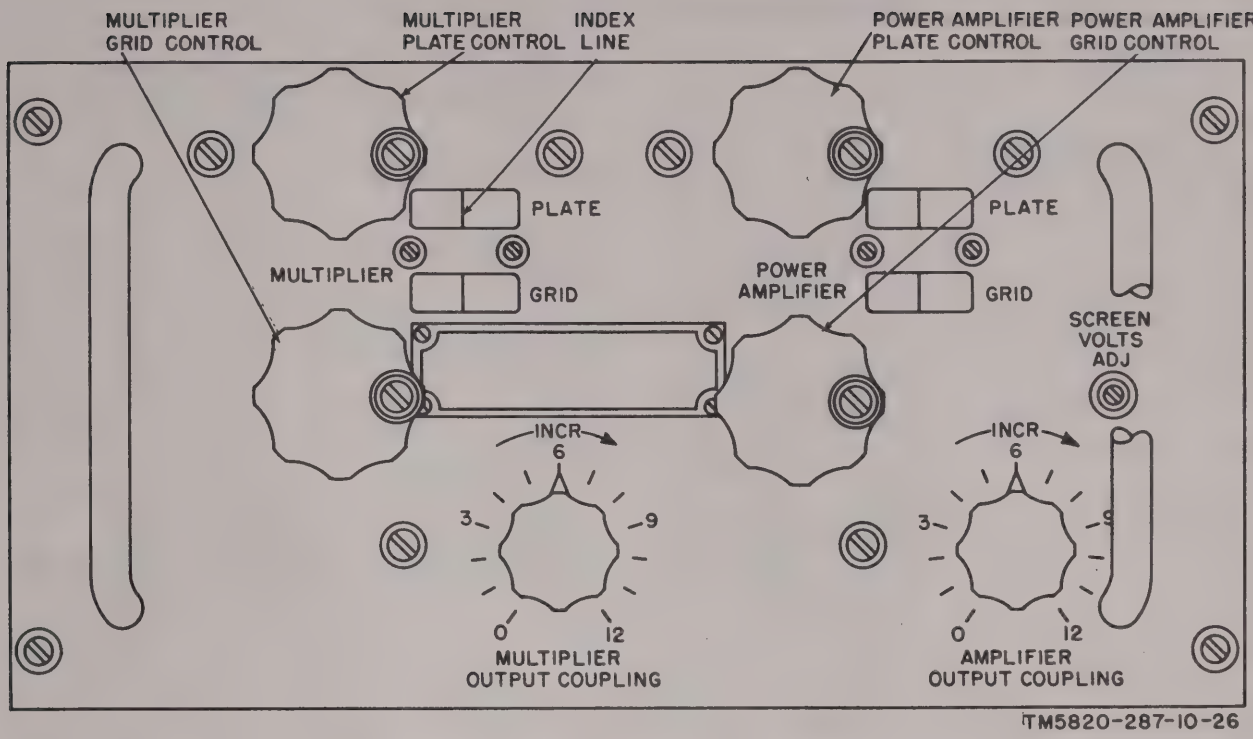


*Figure 27. Amplifier-Multiplier, Radio Frequency AM–915/TRC, front panel.*

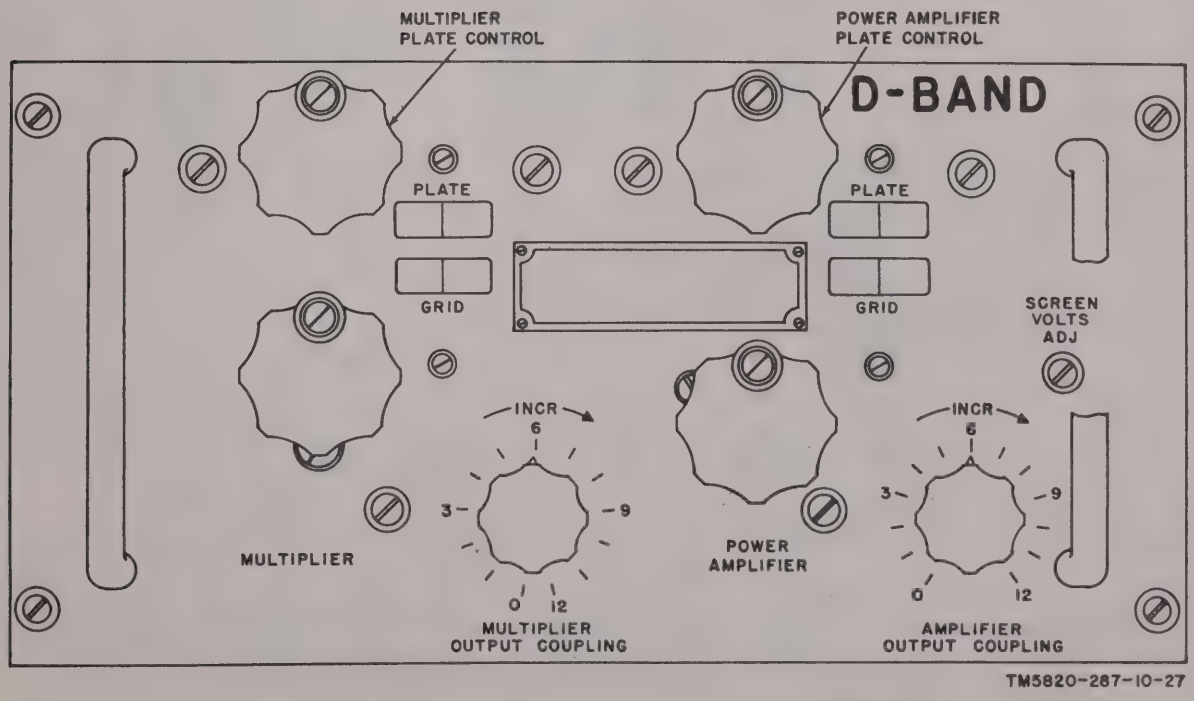


*Figure 28. Amplifier-Multiplier, Radio Frequency AM–1178/GRC, front panel.*

## 16. Amplifier-Converter AM–2537/TRA–25 (E-Band)

(fig. 29)

| Control or indicator | Function |
|---|---|
| REC OSC INJ control | Adjusts signal strength applied to receiver from oscillator-multiplier. |
| OSC TUNE control | Adjusts RF frequency in doubler cavity of oscillator-multiplier. |
| OSC OUTPUT control | Adjusts signal strength of RF frequency from oscillator-multiplier. |
| Mixer tuning control | Adjusts RF frequency of cavity in mixer circuit. |
| MIXER TUNE and PA TUNE dials. | Indicates desired RF channel; orange indicates high channel numbers, green indicates low channel numbers. |
| 350 V voltrol | Adjusts voltage applied to circuits from PP–685/TRC. |
| Power amplifier tuning control | Adjusta RF channel frequency of cavity in power amplifier. |
| MIXER COUPLING control | Adjusts RF frequency of cavity in mixer to match RF frequency of cavity in power amplifier. |
| TEST MULT CATH switch | Connects transmitter TEST meter to circuits indicated when TEST switch is in MULT CATH position. |
| *Switch position* | *Circuit connected* |
| 1ST TRIP CATH | Cathode of 1st tripler. |
| DOUB CATH | Cathode of doubler. |
| MIXER CATH | Cathode of mixer. |
| PA CATH | Cathode of power amplifier. |
| REC XTAL CUR | Crystal mixer diode output of CV–932/TRA–25. |

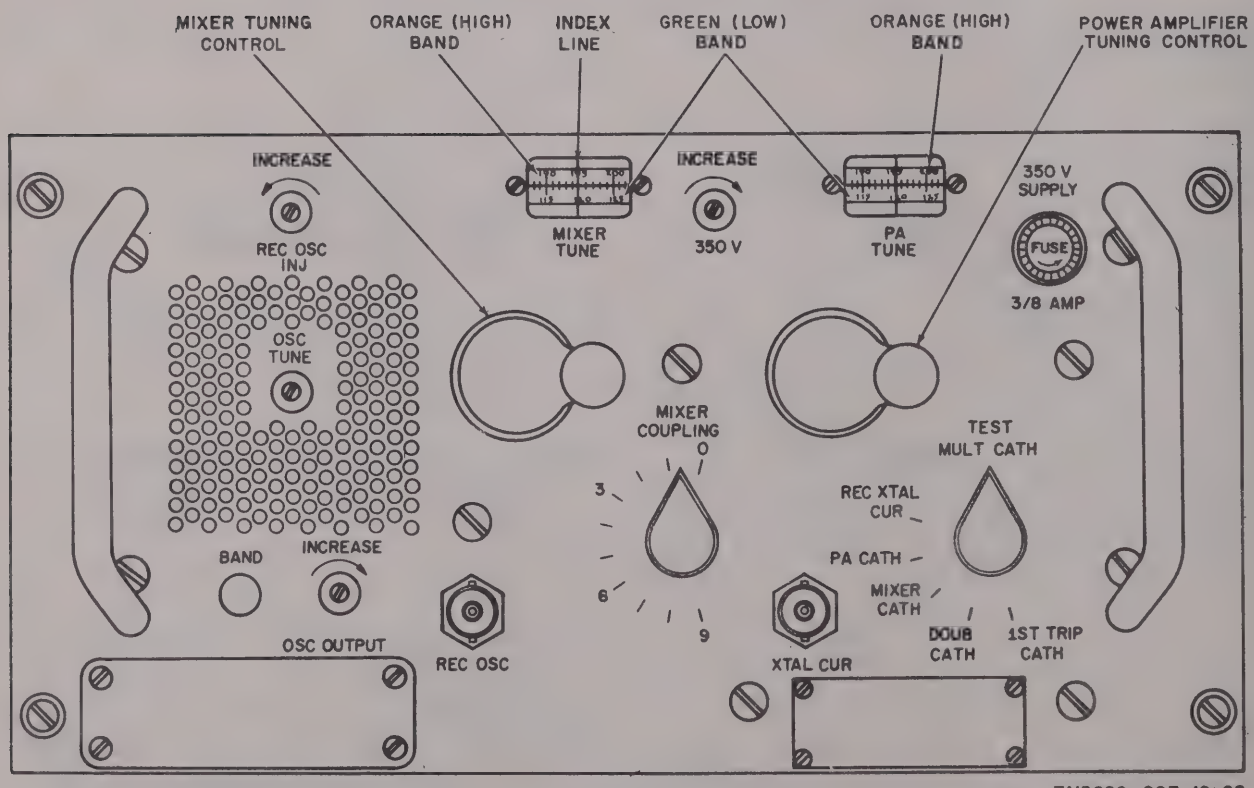


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*Figure 29. Amplifier-Converter AM–2537/TRA–25, front panel.*

## 17. Amplifier-Converter AM–1179/GRC (A-Band) and AM–913/TRC (B-Band)

(fig. 30)

| Control or indicator | Function |
|---|---|
| Tuning control | Adjusts frequency of oscillator and RF amplifier circuits. |
| RF AMP dial | Indicates RF channel number selected by tuning control. |
| AFC control | Adjusts afc circuit. |
| INDEX control | Adjusts index line of RF AMP dial. |

## 18. Amplifier-Converter AM–914/TRC (C-Band)

(fig. 31)

| Control or indicator | Function |
|---|---|
| Tuning control | Adjusts frequency of RF amplifier circuits. |
| COARSE PUSH TO TURN control. | Roughly adjusts frequency of oscillator circuit. |
| FINE control | Accurately adjusts frequency of oscillator circuit. |
| OSC dial | Indicates RF channel number selected by COARSE PUSH TO TURN and FINE controls. |
| RF AMP dial | Indicates RF channel number selected by tuning control. |
| INDEX control | Adjusts position of index line on OSC dial. |
| AFC control | Adjusts afc circuit. |

## 19. Amplifier-Converter AM–1177/GRC (D-Band)

(fig. 32)

| Control or indicator | Function |
|---|---|
| RF amplifier tuning control | Roughly adjusts frequency of RF amplifier circuit. |
| Oscillator tuning control | Adjusts frequency of oscillator circuit. |
| AFC control | Adjusts afc circuit. |

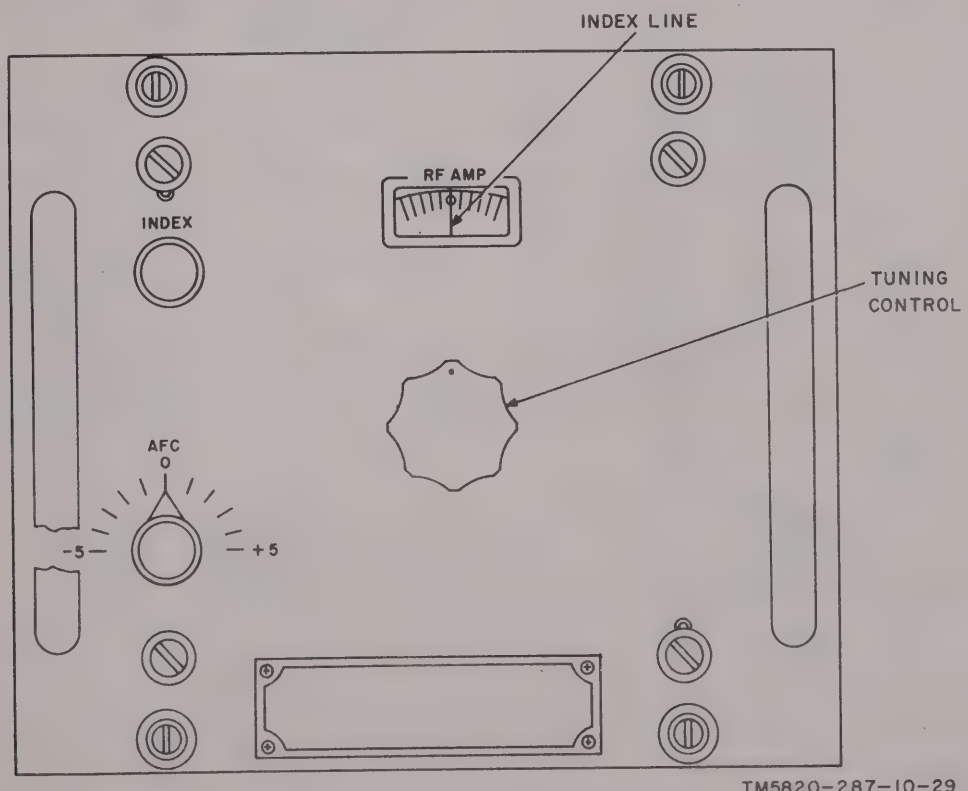


*Figure 30. Amplifier-Converter AM–913/TRC or AM–1179/GRC, front panel.*

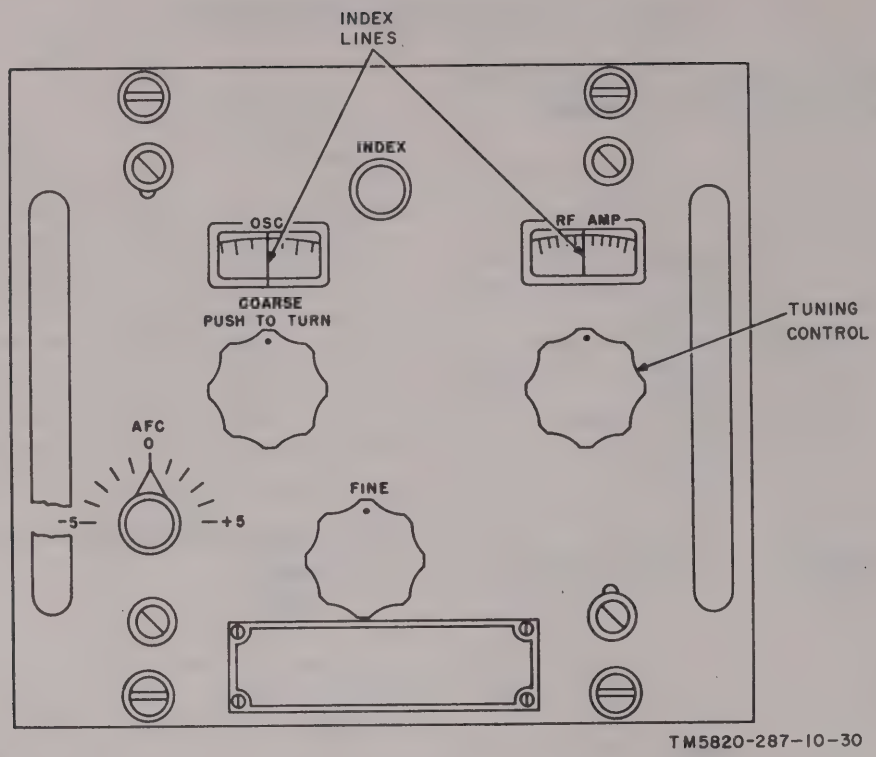


*Figure 31. Amplifier-Converter AM–914/TRC, front panel.*

| Control or indicator | Function |
|---|---|
| RF AMP dial | Indicates RF channel number selected by RF amplifier tuning control. |
| OSC dial | Indicates RF channel number of oscillator selected by oscillator tuning control. |
| INDEX control | Adjusts position of index line on ISC dial. |
| FINE TUNE control | Accurately adjusts frequency of RF amplifier circuit. |

## 20. Mixer Stage, Frequency CV–932/TRA–25 (F-Band)

(fig. 33)

| Control or indicator | Function |
|---|---|
| Mixer tuning dial | Adjusts mixer preselector circuit to desired RF channel number. |
| Antenna tuning dial | Adjusts antenna preselector circuit to desired RF channel number. |
| LO FIL TUN control | Adjusts bandpass filter to frequency of oscillator-multiplier signal of AM–2537/TRA–25. |

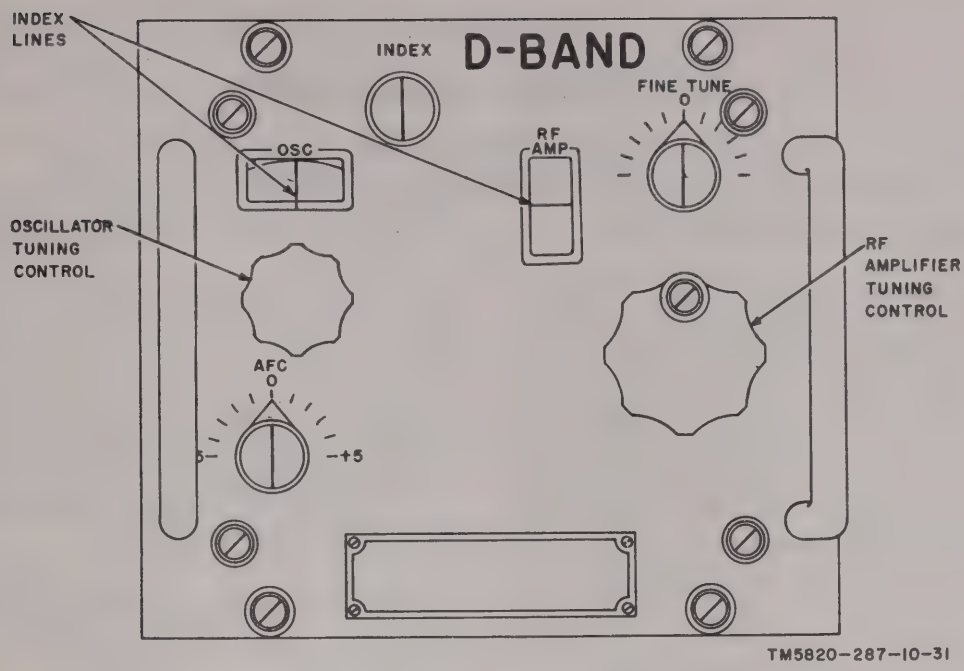


*Figure 32. Amplifier-Converter AM–1177/GRC, front panel.*

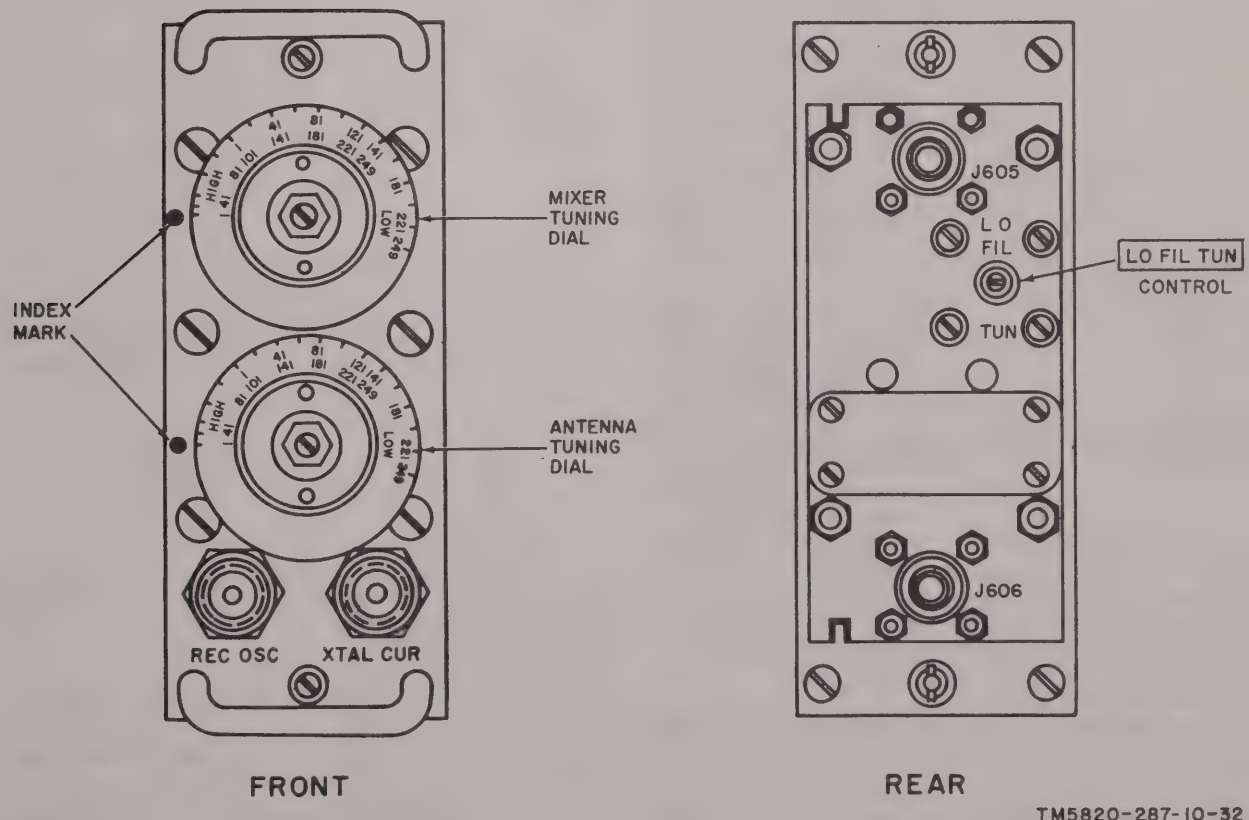


*Figure 33. Mixer Stage, Frequency CV–932/TRA–25, front and rear panels.*

# CHAPTER 3

# PREOPERATIONAL PROCEDURES

## Section I. TRANSMITTER, RECEIVER, AND POWER EQUIPMENT

### 21. Transmitter, Radio T–302(*)/TRC

(fig. 21)

*a. Settings.* Set the controls of the T–302(*)/TRC in the positions indicated in the chart below.

*Note.* If a bandpass filter is installed in the T–302(*)/TRC, operate its tuning controls to the desired rf channel number.

***Caution:* When the tuning controls are turned completely counterclockwise, do not force them beyond their stops. If the tuning controls are forced beyond their stops, their calibration will be inncorrect.**

| Control | Setting |
|---|---|
| INPUT ADJ control | OFF. |
| MEASURE switch | RF CHAN TUNE. |
| AFC switch | OFF. |
| XTAL SEL switch | DECADE CHANS. |
| PULSED OSC switch | ODD CHANNELS for odd RF channel number and EVEN CHANNELS for even RF channel numbers. |
| TUNE control | Adjust until desired RF channel number appears under index pointer of odd channel dial or even channel dial. |
| INDEX control | Adjust until index pointer is centered in RF CHANNEL dial. |
| LOCK control | Turn completely counterclockwise. |
| RF CHANNEL TUNE control. | Adjust until desired RF channel number is centered under index pointer of RF CHANNEL dial. |
| AFC control | 0. |
| DRIVER TUNE control | Adjust until desired RF channel number is idnicated under index pointer of driver channel dial. |
| DRIVER OUTPUT COUPLING control. | 3 on DRIVER OUTPUT COUPLING dial. |
| TEST switch | DRIVER CATH. |
| ALARM switch | OFF. |
| THRESHOLD ADJ control | Fully counterclockwise. |

*b. Connections.*

(1) Disconnect the CG–1030/U from the ANTENNA jack.

(2) Connect the CG–718/U between the ANTENNA jack and the input jack of the ME–82/U (fig. 2).

### 22. Receiver, Radio R–417(*)/TRC

(fig. 22)

*Note.* If a bandpass filter is installed in the receiver, operate its tuning controls to the desired RF channel number.

*a. Settings.*

***Caution:* When the tuning controls are turned completely counterclockwise, do not force them beyond their stops. If the tuning controls are forced beyond their stops, their calibration will be incorrect.**

| Control | Setting |
|---|---|
| POWER circuit breaker | OFF. |
| MEASURE switch | B+. |
| SQUELCH control | Fully counterclockwise. |
| ALARM switch | NOR. |
| OUTPUT ADJ control | Determine the tuning head in use and operate to applicable setting indicated below.<br>25 (A-band).<br>19 (B-band)<br>15 (C-band).<br>12 (D-band).<br>19 (F-band). |

*b. Connections.*

(1) Remove the CG–1030/U from the ANTENNA jack.

(2) Connect the CG–1031/U between the ANTENNA jack and the CAL OUT jack.

### 23. Power Equipment

*a. Power Supply PP–685/TRC* (fig. 23).

| Control | Setting |
|---|---|
| 115V AC circuit breaker | OFF. |
| 750V ADJ control | 2. |
| 750V DC circuit breaker | OFF. |
| 150V DC circuit breaker | OFF. |

*b. Transformer, Power, Fixed Auto Transformer TF–167/TRC and Switch Box SA–331/U.*

(1) Set the INCR OUT switch of TF–167/TRC (A, fig. 24) to position 1.

(2) Set the POWER SUPPLY switch of SA–331/U (B, fig. 24) to position NO. 1 or NO. 2 corresponding to the primary source of power.

*c. Generator Set, Gasoline Engine PU–286/G.* Refer to TM 11–940A.

## Section II. TRANSMITTER TUNING HEADS

### 24. Amplifier, Radio Frequency AM–1180/GRC (A-Band)

(fig. 25)

| Control | Setting |
|---|---|
| PLATE TUNE control | Adjust until desired RF channel number appears under index pointer of plate tune dial. |
| OUTPUT COUPLING control | 6. |

### 25. Amplifier-Multiplier, Radio Frequency AM–912/TRC (B-Band)

(fig. 26)

| Control | Setting |
|---|---|
| GRID control | Adjust until desired RF channel number appears under index line of GRID dial. |
| PLATE control | Adjust until desired RF channel number appears under index line of PLATE dial. |
| AMPLIFIER OUTPUT COUPLING control. | 6. |

### 26. Amplifier-Multiplier, Radio Frequency AM–915(*)/TRC (C-Band)

(fig. 27)

| Control | Setting |
|---|---|
| Multiplier grid control | Adjust until desired RF channel number appears under index line of MULTIPLIER GRID dial. |
| Multiplier plate control | Adjust until desired RF channel number appears under index line of MULTIPLIER PLATE dial. |
| Power amplifier grid control | Adjust until desired RF channel number appears under index line of POWER AMPLIFIER GRID dial. |
| Power amplifier plate control | Adjust until desired RF channel number appears under index line of POWER AMPLIFIER PLATE dial. |
| MULTIPLIER OUTPUT COUPLING control. | 6. |
| AMPLIFIER OUTPUT COUPLING control. | 6. |

### 27. Amplifier-Multiplier, Radio Frequency AM–1178/TRC (D-Band)

(fig. 28)

| Control | Setting |
|---|---|
| MULTIPLIER control | Adjust until desired RF channel number appears under index line of GRID dial (left). |
| Multiplier plate control | Adjust until desired RF channel number appears under index line of PLATE dial (left). |
| POWER AMPLIFIER control. | Adjust until desired RF channel number appears under index line of GRID dial (right). |
| Power amplifier plate control | Adjust until desired RF channel number appears under index line of PLATE dial (right). |
| MULTIPLIER OUTPUT COUPLING control. | 6. |
| AMPLIFIER OUTPUT COUPLING control. | 6. |

### 28. Amplifier-Converter AM–2537/TRA–25 (F-Band)

(fig. 29)

| Control | Setting |
|---|---|
| Mixer tuning control | Adjust until desired RF channel number appears under index line of MIXER TUNE dial. |
| Power amplifier tuning control | Adjust until desired RF channel number appears under index line of PA TUNE dial. |
| MIXER COUPLING control | 6. |
| TEST MULT CATH switch | MIXER CATH. |

## Section II. RECEIVER TUNING HEADS

### 29. Amplifier-Converter AM–1179/GRC (A-Band) and AM–913/GRC (B-Band)

(fig. 30)

| Control | Setting |
|---|---|
| INDEX control | Adjust until index line is centered on RF AMP dial. |
| Tuning control | Adjust until red calibration mark nearest desired RF channel number appears under index line or RF AMP dial. |
| AFC control | 0. |

### 30. Amplifier-Converter AM–914/TRC (C-Band)

(fig. 31)

| Control | Setting |
|---|---|
| INDEX control | Adjust until index line is centered on OSC dial. |
| COARSE PUSH TO TURN control. | Adjust until red calibration mark nearest desired RF channel number appears under index line of OSC dial. |
| Tuning control | Adjust until RF channel number appearing under index line of OSC dial appears under index line of RF AMP dial. |
| AFC control | 0. |
| FINE control | 0. |

### 31. Amplifier-Converter AM–1177/GRC (D-Band)

(fig. 32)

| Control | Setting |
|---|---|
| INDEX control | Adjust until index line is centered on OSC dial. |
| Oscillator tuning control | Adjust until red calibration mark nearest desired RF channel number is under index line of OSC dial. |
| RF amplifier tuning control | Adjust until RF channel number indicated under index line of OSC dial is under index line of RF AMP dial. |
| AFC control | 0. |

### 32. Mixer Stage, Frequency CV–932/TRA–25 (F-Band)

(fig. 33)

| Control | Setting |
|---|---|
| Mixer tuning dial | Adjust until desired RF channel number is alined with index mark. |
| Antenna tuning dial | Adjust until desired RF channel number is alined with index mark. |

# CHAPTER 4

# TUNING PROCEDURES

## Section I. TRANSMITTER

### 33. General

Each transmitter tuning head (A-, B-, C-, D-, or F-band) employed in the T–302(*)/TRC requires a slightly different tuning procedure. Paragraph 34 covers those tuning procedures that are applicable to all of the transmitter tuning heads. Paragraphs 35 through 39 cover tuning procedures that are applicable to the A–, B-, C-, D-, or F-band transmitter tuning heads, respectively. Paragraph 40 covers output power and alarm adjustments that are applicable to all of the transmitter tuning heads.

### 34. Tuning Transmitter, Radio T–302(*)/TRC

*a.* Operate the PU–286/G (TM 11–940A).

*b.* Operate the 115V AC circuit breaker (fig. 23) to ON.

*c.* Operate the INCR OUT switch (fig. 24) until the AC VOLTS meter (fig. 23) indicates 115 volts $\pm 5.5$.

*d.* Operate the 150V DC circuit breaker to ON.

*e.* Allow approximately 10 minutes before proceeding.

*f.* Operate the DC TEST switch to 150 UPPER SCALE.

*g.* Adjust the 150V ADJ control for a 150-volt indication on the DC VOLTS meter.

*h.* Operate and hold the XTAL SEL switch (fig. 21) to DISCR CENTER.

*i.* Adjust the DISCR CENTER control for a zero indication on the FREQ DRIFT meter. The MEASURE meter will indicate more than 15 microamperes.

*j.* Operate the XTAL SEL switch to DECADE CHANS.

*k.* Adjust the RF CHANNEL TUNE control for a maximum indication on the MEASURE meter.

*l.* Adjust the INDEX control until the index pointer of the radiofrequency (RF) channel dial is over the desired RF channel number.

*m.* Operate the XTAL SEL switch to UNIT CHANS.

*n.* Adjust the TUNE control for a maximum indication on the MEASURE meter.

*o.* Operate the LOCK control completely clockwise.

*p.* Operate the MEASURE switch to 1 KC ADJ.

*q.* Adjust the 1 KC ADJ control for a 0–decibel (db) indication on the MEASURE meter.

*r.* Operate the MEASURE switch to MTR CAL.

*s.* Adjust the MTR CAL control for a 0–db indication on the MEASURE meter.

*t.* Operate the MEASURE switch to DISCR RF DRIVE.

*u.* Adjust the DISCR RF DRIVE control for a 0–db indication on the MEASURE meter.

*v.* Operate the MEASURE switch to MOD ADJ.

*w.* Adjust the MOD ADJ control for a 0–db reading on the MEASURE meter.

*x.* Operate and hold the MTR SENS switch to INCR.

*y.* Adjust the MOD TRIM control for a maximum indication on the MEASURE meter.

*Note.* If the indication on the MEASURE meter is beyond full-scale deflection, adjust the MOD ADJ control until the MEASURE meter indication is midscale, and then adjust the MOD TRIM control for a maximum indication on the MEASURE meter.

*z.* Release the MRT SENS switch.

*aa.* Adjust the MOD ADJ control for the correct indication on the MEASURE meter as determined from the chart below.

| Transmitter tuning head | Indication (db) |
|---|---|
| AM–1180/GRC (A-band) | +2 |
| AM–912(*)/TRC (B-band) | +2 |
| AM–915(*)/TRC (C-band) | 0 |
| AM–1178/GRC (D-band) | 0 |
| AM–2537/TRA–25 (F-band) | +2 |

*ab.* Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

*ac.* Operate the 750V DC circuit breaker to ON.

***Caution:*** **If the T–302(*)/TRC has been operating for more than 10 minutes, and the 750V DC circuit breaker is operated to OFF, allow a delay of 1 minute before operating the 750V DC circuit breaker to ON. If the 750V DC circuit breaker is operated to ON without a**

**1-minute delay, the PP–685(*)/TRC may be damaged.**

*ad.* Operate the 750V ADJ switch until an 850-volt ± 35 indication is obtained on the DC VOLTS meter.

*ae.* Operate the DC TEST switch to 275 LOWER SCALE.

*af.* Adjust the SCREEN VOLTS ADJ control (350V control on AM–2537/TRA–25 (F-band)) of the tuning head as indicated in the chart below.

| Transmitter tuning head | Figure | Adjustment |
|---|---|---|
| AM–1180/GRC (A-band). | 25 | Adjust to provide a minimum indication on DC VOLTS meter. |
| AM–912(*)/TRC (B-band). | 26 | Adjust to provide a minimum indication on DC VOLTS meter. |
| AM–915(*)/TRC (C-band). | 27 | Adjust to provide a minimum indication on DC VOLTS meter. |
| AM–1178/GRC (D-band). | 28 | Adjust to provide a minimum indication on DC VOLTS meter. |
| AM–2537/TRA–25 (F-band). | 29 | Adjust to provide +350 volts indication on DC VOLTS meter. |

*ag.* Operate the 750V ADJ control (fig. 23) to 1.

*ah.* Refer to the chart below and determine which paragraph to use for the applicable transmitter tuning head.

| Transmitter tuning head | Paragraph |
|---|---|
| AM–1180/GRC–(A-band) | 35 |
| AM–912(*)/TRC (B-band) | 36 |
| AM–915(*)/TRC (C-band) | 37 |
| AM–1178/GRC (D-band) | 38 |
| AM–2537/TRA–25 (F-band) | 39 |

## 35. Amplifier, Radio Frequency AM–1180/GRC (A-Band)

*a.* Operate the TEST switch (fig. 21) to PWR AMPL GRID.

*b.* Adjust the DRIVER TUNE and the DRIVER OUTPUT COUPLING controls for a maximum indication on the TEST meter.

*c.* Adjust the PLATE TUNE and the OUTPUT COUPLING controls (fig. 25) for a maximum indication on the ME–82/U.

*d.* Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

*e.* Operate the 750V ADJ switch for an indication of 800 volts ± 35 on the DC VOLTS meter.

*f.* Operate the TEST switch (fig. 21) to PWR AMPL CATH.

*g.* Adjust the SCREEN VOLTS ADJ. Control (fig. 25) for an indication of 21 microamperes on the TEST meter (fig. 21).

*h.* Operate the TEST switch to PWR AMPL GRID.

*i.* Adjust the DRIVER TUNE control for a maximum indication on the TEST meter.

*j.* Adjust the DRIVER OUTPUT COUPLING control until the TEST meter indicates more than 25 microamperes or until the DRIVER OUTPUT COUPLING control is turned completely clockwise.

*k.* Repeat the procedures in *c* above.

*l.* Allow the T–302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 35).

*m.* The ME–82/U will indicate from 60 to 100 watts. If additional power is required, perform the procedures in (1) through (3) below.

(1) Operate the TEST switch to PWR AMPL CATH.

(2) Adjust the SCREEN VOLTS ADJ. control (fig. 25) for a maximum indication of 25 microamperes on the TEST meter (fig. 21).

***Caution:* Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifier tubes of the T–302(*)/TRC may be damaged.**

(3) Adjust the DRIVER OUTPUT COUPLING and the DRIVER TUNE controls for a maximum indication on the ME–82/U.

*Note.* The indication on the ME–82/U may be decreased by adjusting the SCREEN VOLTS ADJ. control (fig. 25), or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

*n.* Perform the procedures in paragraph 40.

## 36. Amplifier, Radio Frequency AM–912(*) TRC (B-band)

*a.* Adjust the DRIVER OUTPUT COUPLING control (fig. 21) until the indication on the DRIVER OUTPUT COUPLING dial is two numbers above the original setting.

*b.* Operate the TEST switch to DRIVER CATH.

*c.* Adjust the DRIVER TUNE control until a very slight dip is indicated on the TEST meter.

*d.* Operate the TEST switch to PWR AMPL GRID.

*e.* Adjust the GRID control (fig. 26) for a maximum indication on the TEST meter (fig. 21).

*f.* Operate the 750V ADJ switch (fig. 23) to 2.

*g.* Adjust the DRIVER TUNE controls (fig. 21) for a maximum indication on the TEST meter.

*h.* Adjust the DRIVER OUTPUT COUPLING control for a maximum indication of 20 microamperes on the TEST meter.

*i.* Adjust the PLATE control (fig. 26) and the AMPLIFIER OUTPUT COUPLING control for a maximum indication on the ME–82/U.

*j.* Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

*k.* Operate the 750V ADJ switch for an indication of 850 volts ±35 on the DC VOLTS meter.

*l.* Allow the T–302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 36).

*m.* The ME–82/U will indicate from 70 to 115 watts. If additional power is required, perform the procedures in (1) through (3) below.

(1) Operate the TEST switch (fig. 21) to PWR AMPL CATH.

(2) Adjust the SCREEN VOLTS ADJ control (fig. 26) for a maximum indication of 25 microamperes on the TEST meter (fig. 21).

***Caution:* Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifier tubes of the T–302(*)/TRC may be damaged.**

(3) Repeat the procedures in *i* above.

*Note.* The indication on the ME–82/U may be decreased by adjusting the SCREEN VOLTS ADJ control (fig. 26), or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

*n.* Perform the procedures in paragraph 40.

## 37. Amplifier-Multiplier, Radio Frequency AM–915(*)TRC (C-Band)

*a.* Operate the TEST switch (fig. 21) to DRIVER CATH.

*b.* Adjust the DRIVER OUTPUT COUPLING control until the indication on the DRIVER OUTPUT COUPLING dial is two numbers above the original setting.

*c.* Adjust the DRIVER TUNE control until a very slight dip is indicated on the TEST meter and a maximum indication appears on the ME–82/U.

*d.* Operate the TEST switch to MULT GRID.

*e.* Adjust the multiplier grid control (fig. 27) for a maximum indication on the TEST meter (fig. 21).

*f.* Adjust the DRIVER OUTPUT COUPLING CONTROL for a maximum indication of 20 microamperes on the TEST meter.

*g.* Operate the MULTIPLIER OUTPUT COUPLING control (fig. 27) two positions higher than its original setting.

*h.* Operate the TEST switch (fig. 21) to MULT CATH.

*i.* Adjust the multiplier plate control (fig. 27) for a dip on the TEST meter (fig. 21) and a maximum indication on the ME–82/U.

*j.* Operate the TEST switch to PWR AMPL GRID.

*k.* Operate the power amplifier grid control (fig. 27) for a maximum indication on the TEST meter (fig. 21) and the ME–82/U.

*l.* Adjust the power amplifier plate control (fig. 27) for a maximum indication on the ME–82/U.

*m.* Adjust the AMPLIFIER OUTPUT COUPLING control for a maximum indication on the ME–82/U.

*n.* Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

*o.* Operate the 750V ADJ switch for an indication of 750 volts ±30 on the DC VOLTS meter.

*p.* Allow the T–302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 37).

*q.* The ME–82/U will indicate from 70 to 115 watts. If additional power is required, perform the procedures in (1) and (2) below.

(1) Adjust the SCREEN VOLTS ADJ control (fig. 27) for a maximum indication of 25 microampers on the TEST meter (fig. 21).

***Caution:* Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifier tubes of the T–302(*)/TRC may be damaged.**

(2) Repeat the procedures in *l* and *m* above.

*Note.* The indication on the ME–82/U may be decreased by adjusting the SCREEN VOLTS ADJ control (fig. 27), or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

*r.* Perform the procedures in paragraph 40.

## 38. Amplifier-Multiplier, Radio Frequency AM–1178 TRC (D-Band)

*a.* Operate the TEST switch (fig. 21) to MULT GRID.

*b.* Adjust the DRIVER TUNE control for a maximum indication on the TEST meter.

*c.* Adjust the MULTIPLIER control (fig. 28) for a maximum indication on the TEST meter (fig. 21).

*d.* Adjust the power amplifier plate control (fig. 28) for a maximum indication on the ME–82/U. If there is no indication on the ME–82/U, follow the procedures in (1) through (3) below in the order given until the indication is obtained; then proceed with *e* below.

(1) Operate the 750V ADJ control to 2 and adjust the power amplifier plate control for a maximum indication on the ME–82/U.

(2) Operate the 750V ADJ control to 3 and adjust the power amplifier plate control for a maximum indication on the ME–82/U.

*Caution:* **If no indication is obtained on the ME–82/U within 60 seconds after operating the 750V ADJ control to 4, as described in (3) below, repeat the tuning procedures in paragraph 35. The power amplifier tube in the AM–1178/GRC may be damaged if this precaution is not observed.**

(3) Operate the 750V ADJ control to 4 and adjust the power amplifier plate control for a maximum indication on the ME–82/U.

*e.* Adjust the multiplier plate control and the POWER AMPLIFER control for a maximum indication on the ME–82/U.

*f.* Operate the DRIVER OUTPUT COUPLING control until the test meter (fig. 21) is between 30 and 45 microamperes. If necessary, readjust the MULTIPLIER control (fig. 28), the multiplier plate control, the POWER AMPLIFIER control, and the power amplifier plate control to obtain this indication.

*g.* Allow the T–302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 38).

*h.* The ME–82/U will indicate 50 to 100 watts. If additional power is required, perform the procedures in (1) through (3) below.

(1) Operate the TEST switch to PWR AMPL CATH.

(2) Adjust the SCREEN VOLTS ADJ control (fig. 28) for a maximum indication of 25 microamperes on the TEST meter (fig. 21).

*Caution:* **Do not allow the indication on the TEST meter to exceed 25 microamperes. If a 25-microampere indication is exceeded, the power amplifiers of the T–302(*)/TRC may be damaged.**

(3) Adjust the DRIVER TUNE control (fig. 21), the MULTIPLIER control (fig. 28), the multiplier plate control, the POWER AMPLIFIER control, and the power amplifier plate control for a maximum indication on the ME–82/U.

*Note.* The indication on the ME–82/U may be decreased by adjusting the SCREEN VOLTS ADJ control, or by operating the 750V ADJ control (fig. 23) to a lower position (counterclockwise).

*i.* Perform the procedures in paragraph 40.

## 39. Amplifier-Converter AM–2537 TRA–25 (F-Band)

*a.* Operate the DC TEST switch (fig. 23) to 750 LOWER SCALE.

*b.* Operate the 750V ADJ switch for an indication of 850 volts ±35 on the DC VOLTS meter.

*c.* Operate the TEST switch (fig. 21) to MULT CATH.

*d.* Operate the TEST MULTH CATH switch (fig. 29) to MIXER CATH.

*e.* Adjust the DRIVER TUNE control (fig. 21) for a dip on the TEST meter.

*f.* Adjust the DRIVER OUTPUT COUPLING control for an indication of 30 microamperes on the TEST METER.

*g.* Adjust the mixer tuning control (fig. 29), the MIXER COUPLING control, and the power amplifier tuning control for a maximum indication on the ME–82/U. The indication on the ME–82/U will be more than 10 watts.

*h.* Allow the T–302(*)/TRC 30 minutes to warm up, and repeat the tuning procedures (pars. 34 and 39).

*i.* Proceed as indicated in paragraph 40

## 40. Adjusting Transmitter, Radio T–302(*)/TRC Output Power and Alarm

When a dummy filter (fig. 1) is installed in the T–302(*)/TRC, follow the procedures in *a* below. When a bandpass filter is installed in place of the dummy filter in the T–302(*)/TRC, follow the procedures in *b* below.

*a. Adjustments With Dummy Filter.*

(1) Operate the 750V DC circuit breaker (fig. 23) to OFF.

(2) Disconnect the CG–718/U with the attached ME–82/U from the ANTENNA jack (fig. 21).

(3) Connect the CG–1030/U, attached to the transmitter antenna, to the ANTENNA jack.

(4) Operate the TEST switch to FWD PWR.

***Caution:* Allow a delay of 1 minute before proceeding. If the following step is performed without a 1-minute delay, the PP–685(*)/TRC may be damaged.**

(5) Operate the 750V DC circuit breaker (fig. 23) to ON and note the indication on the TEST meter (fig. 21).

(6) Adjust the DRIVER TUNE control for an indication on the TEST meter, which is approximately 70 percent of that noted in (5) above.

(7) Operate the ALARM switch to NOR.

(8) Rotate the THRESHOLD ADJ control clockwise until the LOW PWR ALARM indicator illuminates and a buzzer sounds.

***Caution:* This adjustment is critical. After the LOW PWR ALARM indicator illuminates and the buzzer sounds, further clockwise rotation of the THRESHOLD ADJ control will cause improper calibration. *Do not rotate* the THRESHOLD ADJ control more than is required to illuminate the LOW PWR ALARM indicator and sound the buzzer.**

(9) Adjust the DRIVER TUNE control to obtain a maximum indication on the TEST meter; the LOW PWR ALARM indicator will extinguish and the buzzer will not sound.

(10) Operate the ALARM switch to REV; the LOW PWR ALARM indicator will not illuminate, and the buzzer will sound.

(11) Repeat the procedure in (6) above; the LOW PWR ALARM indicator will illuminate, and the buzzer will not sound.

(12) Operate the ALARM switch to NOR and adjust the DRIVER TUNE control for a maximum indication on the ME–82/U.

*b. Adjustments With Bandpass Filter.*

(1) Perform the procedures in *a*(1) through (5) above.

(2) Adjust the tuning controls on the bandpass filter for a maximum indication on the TEST meter (fig. 21).

***Caution:* When the tuning controls are turned completely counterclockwise, do not force them beyond their stops. If the tuning controls are forced beyond their stops, their calibration will be incorrect.**

(3) Perform the procedures in *a*(6) through (12) above.

## Section II. RECEIVER

### 41. General

Each receiver tuning head (A-, B-, C-, D-, or F-band) employed in the R–417(*)/TRC requires a slightly different tuning procedure. Paragraph 42 covers those tuning procedures that are applicable to all of the receiver tuning heads. Paragraphs 43 through 46 cover only those tuning procedures that are applicable to the A-, B-, C-, D-, or F-band receiver tuning heads, respectively. Paragraph 47 covers the output and alarm adjustments that are applicable to all of the receiver tuning heads.

### 42. Tuning Receiver, Radio R–417(*)/TRC

*a.* Operate the POWER circuit breaker (fig. 22) to ON.

*b.* Allow the R–417(*)/TRC 10 minutes to warm up.

*c.* Operate the MEASURE switch to 2ND LIM.

*d.* Refer to the chart below and determine which paragraph to use for the applicable receiver tuning head.

| Receiver tuning head | Paragraph |
|---|---|
| AM–1179/GRC (A-band) and AM–913/TRC (B-band). | 43 |
| AM–914/TRC (C-band) | 44 |
| AM–1177/GRC–(D-band) | 45 |
| CV–932/TRA–25 (F-band) | 46 |

### 43. Amplifier-Converter AM–1179/GRC (A-Band) or AM–913(*)/TRC (B-Band)

*a.* Turn the SQUELCH control (fig. 22) clockwise until a 5-microampere indication is obtained on the MEASURE meter.

*b.* Operate the ALARM switch to REV.

*c.* Operate and hold the AFC-OFF-CAL switch to CAL.

*d.* Operate the ALARM switch to NOR.

*e.* Adjust the tuning control (fig. 30) for a maximum indication on the MEASURE meter (fig. 22) and a zero indication on the FREQ DRIFT meter.

*f.* Adjust the INDEX control (fig. 30) until the index line of the RF AMP dial is directly over the red calibration mark nearest the desired RF channel number.

*g.* Release the AFC–OFF–CAL switch.

*h.* Operate the ALARM switch (fig. 22) to REV.

*i.* Adjust the tuning control (fig. 30) until the desired RF channel number is directly under the index line of the RF AMP dial.

*j.* Operate the ALARM switch to NOR.

*k.* Perform the procedures in paragraph 47.

## 44. Amplifier-Converter AM–914(*)/TRC (C-Band)

*a.* Turn the SQUELCH control (fig. 22) counterclockwise until a 5–microampere indication is obtained on the MEASURE meter.

*b.* Operate the ALARM switch to REV.

*c.* Adjust the tuning control (fig. 31) for a maximum indication on the MEASURE meter (fig. 22).

*d.* Adjust the SQUELCH control so that the indication on the MEASURE meter does not exceed 30 microamperes.

*e.* Operate and hold the AFC–OFF–CAL switch to CAL.

*f.* Adjust the FINE control (fig. 31) for a zero indication on the FREQ DRIFT meter (fig. 22) and a maximum indication on the MEASURE meter. Note the direction of rotation for the FINE control (fig. 31) when making the final setting.

*g.* Release the AFC-OFF-CAL switch (fig. 22).

*h.* Adjust the INDEX control (fig. 31) so the index line of the OSC dial is directly over the red calibration mark nearest the desired RF channel frequency.

*i.* Adjust the FINE control until the desired RF channel marking is directly under the index line of the OSC dial.

*Note.* When making the final setting of the FINE control, be sure that the direction of rotation is the same as that noted in *f* above. It it is not, dial backlash error will cause incorrect calibration.

*j.* Adjust the tuning control until the desired RF channel marking is directly under the index line of the RF AMP dial.

*k.* Perform the procedures in paragraph 47.

## 45. Amplifier-Converter AM–1177/GRC (D-Band)

*a.* Operate and hold the AFC–OFF–CAL switch (fig. 22) to CAL.

*b.* Adjust the oscillator tuning control (fig. 32) for a zero indication on the FREQ DRIFT meter (fig. 22).

*c.* Adjust the RF amplifier tuning control (fig. 32) for a maximum indication on the MEASURE meter (fig. 22).

*d.* Adjust the FINE TUNE control (fig. 32) for a maximum indication on the MEASURE meter (fig. 22).

*e.* Release the AFC–OFF–CAL switch.

*f.* Adjust the oscillator tuning control (fig. 32) until the desired RF channel number is directly under the index line of the OSC dial.

*g.* Adjust the RF amplifier tuning control until the desired RF channel number is directly under the index line of the RF AMP dial.

*h.* Adjust the FINE TUNE control for a maximum indication on the MEASURE meter (fig. 22).

*i.* Adjust the RF amplifier tuning control (fig. 32) for a maximum indication on the MEASURE meter (fig. 22).

## 46. Mixer Stage, Frequency CV–932/TRA–25 (F-Band)

*a.* Perform the procedures in paragraph 43 for the AM–913(*)/TRC.

*b.* Adjust the mixer tuning dial (fig. 33) for a maximum indication on the MEASURE meter (fig. 22).

*c.* Adjust the antenna tuning dial (fig. 33) for a maximum indication on the MEASURE meter (fig. 22).

*d.* Perform the procedures in paragraph 47.

## 47. Adjusting Receiver, Radio R-471(*)/TRC Output and Alarm

*a.* Disconnect the CG–1031/U from the ANTENNA jack (fig. 22) and the CAL OUT jack.

*b.* Connect the CG–718/U between the ANTENNA jack and the ME–82/U.

*c.* Rotate the SQUELCH control counterclockwise to a point where a buzzer sounds and the ALARM indicator illuminates.

***Caution:*** **This adjustment is critical. After the buzzer sounds and the ALARM indicator illuminates, further counterclockwise rotation of the SQUELCH control will provide improper calibration.** ***Do not rotate*** **the SQUELCH**

**control more than is required to illuminate the ALARM indicator and sound the buzzer.**

*d.* Operate the ALARM switch to REV.

*e.* Operate the AFC-OFF-CAL switch to AFC.

*f.* Disconnect the CG–718/U with the attached ME–82/U from the ANTENNA jack.

*g.* Connect the CG–1030/U attached to the receiving antenna, to the ANTENNA jack.

*h.* When the carrier signal is present (indicated by a buzzing sound), operate the ALARM switch to NOR.

*i.* Operate the MEASURE switch to SIG LEV.

*j.* If a bandpass filter is installed in the R–417(*)/TRC, adjust its controls for a maximum indication on the MEASURE meter.

# CHAPTER 5

# LINEUP, OPERATING, AND STOPPING PROCEDURES

## Section 1. RADIO SECTION LINEUP

### 48. General

When a radio section consist of a signal radio hop (A, fig. 19), perform the procedures in paragraph 49. When a radio section consists of several radio hops (B, fig. 19), perform the procedures in paragraph 49 for *each* radio hop, and the procedures in paragraph 50 for the overall radio section.

### 49. Single-Hop Radio Section Lineup

Designate the radio set or radio terminal set at one end of the radio section as station A (control station). Designate the radio set or radio terminal set at the other end of the radio section as station B (end station). Proceed as outlined below.

*a.* Disconnect the leads on the REC terminals (fig. 22) at stations A and B.

*b.* Connect a 130-ohm resistor (fig. 16) across the REC terminals (fig. 22) at stations A and B.

*c.* Perform the following procedures at station A.

(1) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.

(2) Operate the order-wire circuit (par. 55) and instruct the operator at station B to perform the procedures in *d* below.

(3) Operate the MEASURE switch to MOD ADJ.

*d.* Perform the following procedures at station B when instructed by the operator of station A.

(1) Operate the MEASURE switch (fig. 22) to 1 KC OUT.

(2) Adjust the OUTPUT ADJ control for a 0–db indication on the MEASURE meter.

(3) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.

(4) Operate the order-wire circuit (par. 55) and instruct the operator at station A to perform the procedures in *e* below.

(5) Operate the MEASURE switch to MOD ADJ.

e. Perform the following procedures at station A when instructed by the operator of station B.

(1) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.

(2) Operate the MEASURE switch (fig. 22) to 1KC OUT.

(3) Adjust the OUTPUT ADJ control for a 0–db indication on the MEASURE meter.

(4) Operate the order-wire circuit (par. 55) and instruct the operator of station B to perform the procedures in *f* below.

*f.* Operate the MEASURE switch to MOD 68 KC IN when instructed by the operator of station A.

*g.* If the procedures in paragraph 50 are not required, perform the procedures in (1) below. If the procedures in paragraph 50 are required, perform the procedures in (2) below.

(1) *Single-link radio section.*

(*a*) Disconnect the 130-ohm resistor (fig. 16) from the REC terminals (fig. 22) at stations A and B.

(*b*) Connect the leads (*a* above) to the REC terminals at stations A and B.

(2) *Multiple-link radio section.*

(*a*) Disconnect the 130-ohm resistor (fig. 16) from the REC terminals (fig. 22) at all stations except the end statiqns.

(*b*) Connect the leads (*a* above) to the REC terminals at all stations except the end stations.

### 50. Multiple-Link Radio Section Lineup

Perform the procedures in *a* below to line up the links of the radio section for a signal transmitted from the control station to the end station. Perform the procedures in *b* below to line up the links of the radio section for a signal transmitted from the end station to the control station. Perform the procedures in *c* below when the lineup procedures in *a* and *b* below have been completed.

*a. Control-Station to End-Station Lineup.*

(1) Perform the following procedures at the control station:

(*a*) Operate the order-wire circuit (par. 55) and instruct the operator at the radio relay set or radio repeater set station to perform the procedures in (2) below.

(*b*) Operate the MEASURE switch (fig. 21) to MOD ADJ.

(2) Perform the following procedures at the

radio relay set or radio repeater set station when instructed by the operator of the preceding station:

(*a*) Operate the MEASURE switch (fig. 21) to 1 KC IN.

(*b*) Adjust the INPUT ADJ control for a 0–db indication on the MEASURE meter.

(*c*) Operate the MEASURE switch to MOD 68 KC IN.

(*d*) Operate the order-wire circuit (par. 55) and instruct the operator at the next radio relay or radio repeater station to repeat these procedures.

*Note.* If the next station is the end station, instruct the operator to perform the procedure in *b*(1) below.

(*e*) Operate the MEASURE switch to 1 KC IN.

*b. End-Station to Control-Station Lineup.*

(1) Perform the procedures in *a*(1) above at the end station.

(2) Perform the procedures below for each radio relay set or radio repeater set when instructed by the operator of the preceding station.

(*a*) Perform the procedures in *a*(2)(*a*) through (*c*) above.

(*b*) Operate the order-wire circuit and instruct the operator at the next radio relay or radio repeater station to repeat these procedures.

*Note.* If the next station is the control station, instruct the operator to perform the procedures in *c* below.

*c. Preparation for Carrier System Lineup.*

(1) Disconnect the 130-ohm resistor (fig. 16) from the REC terminals (fig. 21) at the end stations.

(2) Connect the leads (par. 49*a*) to the REC terminals at the end stations.

## Section II. CARRIER SYSTEM LINEUP

### 51. General

The carrier system lineup is performed with the radio section connected to the wire section of the carrier system. The carrier system lineup is controlled by the operator of the carrier telephone terminal of the wire section designated as the control terminal. When the radio section is used with a 4-channel carrier system, follow the procedures in paragraph 52. When the radio section is used with a 12-channel system follow the procedures in paragraph 53.

### 52. Carrier System Linup (4-channel)

*a.* Perform the procedures outlined below at the end station of the radio section that connects to the carrier terminal line, when instructed by the control terminal operator.

(1) Operate the MEASURE switch (fig. 21) to MOD 1 KC IN.

(2) Adjust the INPUT ADJ control in an indication of the MEASURE meter that corresponds to the indication listed in the chart below.

| Transmitter tuning head | Indication |
|---|---|
| AM–1180/GRC (A-band) | +2 |
| AM–912(*)/TRC (B-band) | +2 |
| AM–915(*)TRC (C-band) | 0 |
| AM–1178/GRC (D-band) | 0 |
| AM–2537/TRA–25 (F-band) | +2 |

(3) Operate the MEASURE switch (fig. 22) to 1 KC OUT.

(4) Adjust the OUTPUT ADJ control for a 0–db indication on the MEASURE meter.

*b.* Perform the procedures in *a* above at each station of the radio section until the carrier system lineup has been completed in one direction.

*c.* Operate the order-wire circuit (par. 55) and inform the control terminal operator that the lineup adjustments have been completed for one direction.

*d.* When instructed by the control terminal operator, perform the procedures in *a* through *c* above for carrier system lineup in the opposite direction.

*e.* Operate the order-wire circuit (par. 55) and inform the control terminal operator of completion of the carrier system lineup.

### 53. Carrier System Lineup (12-channel)

*a.* Perform the procedures below at the end station of the radio section that connects to the carrier terminal line, when instructed by the control terminal operator.

(1) Operate the MEASURE switch (fig. 21) to MOD 68 KC IN.

(2) Adjust the INPUT ADJ control for an indication on the MEASURE meter that corresponds to the indication listed in the chart (par. 52*a*(2)).

(3) Operate the MEASURE switch (fig. 22) to 68 KC OUT.

(4) Adjust the OUTPUT ADJ control for a 0–db indication on the MEASURE meter.

*b.* Perform the procedures in *a* above at each station of the radio section unlil the carrier system lineup procedures have been completed in one direction.

*c.* Operate the order-wire circuit (par. 55) and inform the terminal office operator that the lineup adjustments are completed in one direction.

*d.* When instructed by the control terminal operator, perform the procedures in *a* through *c* above for carrier system lineup in the oppsoite direction.

*e.* Operate the order-wire circuit (par. 55) and inform the control terminal operator of completion of the carrier system lineup.

## Section III. OPERATING UNDER USUAL CONDITIONS AND STOPPING PROCEDURES

### 54. Operating Checks

Each day, while the equipment is in service, operate the specified switches to the positions listed on the following charts and observe the meter indications. If the correct meter indications are not obtained, operate the order wire circuit (par. 55) and notify the control terminal operator.

*a. Transmitter, Radio T–302(*)/TRC.*

(1) *MEASURE switch (fig. 21).*

| Position | Required indication on MEASURE meter |
|---|---|
| RF CHAN TUNE | 5 to 45 μa. |
| 1 KC ADJ | 0 db. |
| MTR CAL | 0 db. |
| DISCR RF DRIVE | 0 db. |
| 1 KC IN | 0 db. (present only when 1-kc test signal is received from carrier terminal equipment). |
| 68 KC IN | 0 db (present only with 12-channel system). |
| MOD 1 KC IN: | Present only when 1-kc test signal is received from carrier terminal equipment. |
| A-band | +2 db. |
| B-band | +2 db. |
| C-band | 0 db. |
| D-band | 0 db. |
| F-band | +2 db. |
| MOD 68 KC IN: | Present only with 12-channel system. |
| A-band | +2 db. |
| B-band | 0 db. |
| C-band | 0 db. |
| D-band | 0 db. |
| F-band | +2 db. |

(2) *TEST switch (fig. 21).*

| Position | Required indication on TEST meter |
|---|---|
| OSC MOD PLATE | 12 to 16 μa. |
| DRIVER GRID | 10 to 16 μa. |
| DRIVER CATH | 25 μa. |
| MULT GRID: | |
| A-band | Not used. |
| B-band | Not used. |
| C-band | 30 to 40 μa. |
| D-band | 30 to 45 μa. |
| F-band | Not used. |
| MULT CATH: | |
| A-band | Not used. |
| B-band | Not used. |
| C-band | 14 μa. |
| D-band | 10 to 25 μa. |
| F-band | Refer to (3) below. |
| PWR AMPL GRID: | |
| A-band | 20 to 25 μa. |
| B-band | 20 to 25 μa. |
| C-band | 20 to 25 μa. |
| D-band | 1 to 25 μa. |
| F-band | Not used. |
| PWR AMPL CATH: | |
| A-band | 25 μa maximum. |
| B-band | 25 μa maximum. |
| C-band | 25 μa maximum. |
| D-band | 25 μa maximum. |
| F-band | Not used. |
| FWD PWR: | |
| A-band | 30 μa or higher. |
| B-band | 30 μa or higher. |
| C-band | 30 μa or higher. |
| D-band | 30 μa or higher. |
| F-band | 10 μa or higher. |
| REFL PWR: | |
| A-band | 10 μa or lower. |
| B-band | 10 μa or lower. |
| C-band | 10 μa or lower. |
| D-band | 10 μa ro lower. |
| F-band | 2 μa or lower. |

(3) *TEST MULT CATH switch (F-band)* (fig. 29).

| Position | Required indication on TEST meter (fig. 21) with TEST switch in MULT CATH |
|---|---|
| 1ST TRIP CATH | 14 to 16 μa. |
| DOUB CATH | 17 to 20 μa. |
| MIXER CATH | 30 μa. |
| PA CATH | 35 to 45 μa. |
| REC XTAL CUR | 10 μa. |

*b. Receiver, Radio R–417(*)/TRC* (fig. 22).

| MEASURE switch position | Required indication on MEASURE meter |
|---|---|
| OSC | 15 μa or higher. |
| MIX | 15 μa or higher. |
| SIG LEV | 30 μa. |
| 1ST LIM | 10 μa. |
| 2ND LIM | 30 μa. |
| MTR CAL | —5 to +5 db. |
| 1 KC OUT | —5 to +5 db. |
| 68 KC OUT | —5 to +5 db. |
| B+ | +29 to +30 μa. |

*c. Power Supply PP–685(*)/TRC* (fig. 23).

| Position on DC TEST switch | Indication on meter (volts) | |
|---|---|---|
| | AC VOLTS | DC VOLTS |
| 150 UPPER SCALE | 115±5.5 | 150 |
| 750 LOWER SCALE: | | |
| A-band | 115±5.5 | 800 |
| B-band | 115±5.5 | 850 |
| C-band | 115±5.5 | 750 |
| D-band | 115±5.5 | 750 |
| F-band | 115±5.5 | 900 |
| 275 LOWER SCALE: | | |
| A-band | 115±5.5 | 275 maximum |
| B-band | 115±5.5 | 275 maximum |
| C-band | 115±5.5 | 275 maximum |
| D-band | 115±5.5 | 275 maximum |
| F-band | 115±5.5 | 300 |

## 55. Order-Wire Operation
(fig. 22)

The procedures for initiating a call to other stations in the carrier system are outlined in *a* below. The procedures for answering a call from another station in the carrier system are outlined in *b* below.

*a. Initiating Calls.*

(1) Remove Handset H–90/U from the handset rack.

(2) Operate the TALK-RING switch to TALK.

(3) Listen to the receiver of the H–90/U to determine whether the order-wire circuit is in use.

(4) When it has been determined that the order-wire circuit is not in use, hold the TALK-RING switch to RING for approximately 2 seconds.

*Note.* When station codes are assigned to each individual station, operate the TALK-RING switch to RING and release it according to the station code of the station being contacted.

(5) Operate the TALK-RING switch to TALK.

(6) Operate the transmit switch on the H-90/U and speak through the transmitter of the H–90/U.

*Note.* When listening to the receiver of the H–90/U, it is not necessary to have the transmit switch operated.

*b. Answering Calls.*

(1) When a ringing signal is heard, remove the H–90/U from the handset rack.

*Note.* When station codes are assigned to each station, remove the H–90/U only when the ringing signal corresponds to the station code assignment.

(2) Operate the TALK-RING switch to TALK

(3) Perform the procedures given in *a*(6) above.

## 56. Stopping procedures

*a.* Operate the POWER circuit breaker (fig. 22) to OFF.

*b.* Operate the 750V DC circuit breaker (fig. 23) to OFF.

*c.* Operate the 150V DC circuit breaker to OFF.

*d.* Operate the 115V DC circuit breaker to OFF.

*e.* Turn off the PU–286/U (TM 11–940A).

# Section IV. OPERATING UNDER UNUSUAL CONDITIONS

## 57. General

The radio equipment may have to be operated in regions where extreme cold, heat, humidity or other moisture, sand conditions, etc, prevail. Although every precaution is taken in the design of the equipment to maintain its technical characteristics over a

wide temperature and humidity range, adverse conditions may cause poor transmission and reception unless additional precautions are taken. Paragraphs 58 through 60 provide procedures that minimize the effects of these unusual climatic conditions.

## 58. Operation in Arctic Climates

Subzero temperature and climatic conditions associated with cold weather affect the efficient operation of the system. Observe the following instructions and precautions when operating under such adverse conditions:

*a.* Keep the equipment warm and dry.

*b.* When equipment that has been exposed to the cold is brought into a warm room, moisture will gather on it until the equipment reaches room temperature. This may cause a change in the operating characteristics. When the equipment reaches room temperature, dry it thoroughly. Moisture will also condense on the equipment from exposure during a cold night.

## 59. Operation in Tropical Climates

When operating in tropical climates, the equipment may be installed in tents, huts, or when necessary in underground dugouts. When the equipment is installed in dugouts, or when it is set up in swampy areas, moisture conditions are more acute than normal. Ventilation is usually very poor, and the high relative humidity causes condensation on the equipment whenever the temperature of the equipment becomes lower than that of the surrounding air. To minimize this condition, provide the best possible ventilation. Dry the equipment thoroughly. This condition may also be minimized by placing lighted electric bulbs near the equipment.

## 60. Operation in Desert Climates

*a.* The main problem that arises with equipment operation in desert areas is the large amount of sand, dust, or dirt that enters the moving parts.

*b.* Be careful to keep the equipment as free from dust as possible. Make frequent preventive maintenance checks (par. 64).

*c.* Never tie power cords or other wiring connections to either the inside or the outside of tents. Desert areas are subject to sudden wind squalls, which may jerk connections loose or break the lines.

*d.* A drop in temperature during the night often causes moisture condensation on the equipment the following day; dry the equipment thoroughly.

*e.* If the equipment is housed in a building, make the building as dustproof as possible by performing the following:

(1) Hang wet sacking over the windows and doors.

(2) Cover the inside walls with heavy paper.

*f.* If the equipment is housed in a tent, use sand to secure the outside walls of the tent to prevent their flapping in the wind.

## 61. Operation With Enemy Jamming Interference

When enemy jamming interfers with the reception of the carrier signal, operate the order-wire circuit (par. 55) and notify the control terminal. When instructed by the control terminal operator, detune the R–417(*)/TRC (*a* below) or change the RF channel frequency (*b* below).

*a. Detuning R–417(*)/TRC.*

(1) Detune the receiver tuning head slightly above or below the operating RF channel frequency. The chart below lists the control or controls for the applicable tuning head.

| Receiver tuning head | Control |
|---|---|
| AM–1179/GRC (A-band) and AM–913/TRC (B-band). | Tuning control (fig. 30). |
| AM–914/TRC (C-band) | Tuning control (fig. 30). |
| AM–1177/GRC (D-band) | Rf amplifier tuning control (fig. 32). |
| CV–932/TRA–25 (F-band) | Antenna tuning dial (fig. 33) and tuning control (fig. 30) of AM–913(*)/TRC. |

(2) Adjust the SQUELCH control (fig. 22) for best reception. If the reception does not improve, turn the SQUELCH control completely clockwise.

(3) Adjust the tuning controls of the bandpass filter in the R–417(*)/TRC slightly above or below the operating RF channel frequency to attenuate the enemy jamming signal.

(4) Adjust the OUTPUT ADJ control for a maximum indication on the MEASURE meter.

(5) Operate the order-wire circuit (par. 55) and notify the control office of the effect that the dentuning procedures had on the interference caused by the enemy jamming signal.

*b. Changing RF Channel Frequency.*

(1) Perform the starting procedures (ch. 4).

(2) Perform the lineup procedures (pars. 48—53).

(3) Operate the order-wire circuit (par. 55) and notify the control terminal when the procedures in (1) and (2) above are complete.

# CHAPTER 6

# MAINTENANCE INSTRUCTIONS

## 62. Scope of Operator's Maintenance

The following is a list of maintenance duties normally performed by the operator of the radio equipment. These procedures do not require special tools or test equipment.

*a.* Preventive maintenance of the PU–286/U (TM 11–940A).

*b.* Preventive maintenance of the radio equipment (par. 64).

*c.* Visual inspection (par. 65).

*d.* Operator's troubleshooting checklist (par. 66).

## 63. Tools and Materials Required

Refer to appendix II for a list of the operator's repair parts. The tools and materials required for preventive maintenance are listed below.

*a.* Lint-free cloth.

*b.* Insulation Tape, Electrical TL–83 (fig. 5).

*c.* Insulation Tape, Electrical TL–192 (fig. 5).

*d.* Cleaning Compound (Federal Stock No. 7930–395–9542).

*e.* Screwdriver TL–358/U (fig. 2).

*f.* Stiff bristle brush.

## 64. Preventive Maintenance

*a. DA Form 11–238.* Items 1 through 12 on DA Form 11–238 (figs. 34 and 35) constitute the preventive maintenance checklist to be used by the operator. Items not applicable to the equipment are lined out in the figures. References in the ITEM block in the figures are to items in those paragraphs which contain additional maintenance information pertinent to the particular item. Instructions for the use of DA Form 11–238 appears on page one of the form.

*b. Items.* The information shown in this paragraph is supplementary to DA Form 11–238. The item numbers correspond to the ITEM numbers on the form. *Do not* perform the maintenance procedures in items 2 and 7 with the power on. These maintenance procedures should be performed during interruptions in system service.

| Item No. | Maintenance procedures |
|---|---|
| 2 | If necessary, wet a cloth with cleaning compound and clean the parts; dry the parts with a lint-free cloth. |
| 3 | When equipment is operating, check, only those controls listed in the operating checks (par. 54). |
| 7 | Repair any cuts in the insulation by covering them with Insulation Tape, Electrical TL–83 and TL–192. |
| 8 | Tape all loose ends of guy wires to the taut guy wires. |

***Warning:*** **Cleaning compound is flammable and its fumes are toxic. Do not use near a flame; provide adequate ventilation.**

## 65. Visual Inspection

*a.* When the equipment fails to operate properly operate the order-wire circuit (par. 55), request permission from the circuit control authority to turn off the power, and check the items listed below. *Do not check any items with the power on.*

(1) Worn or broken cables.
(2) Loose or improper seating of connectors.
(3) Damaged lighting protectors (fig. 22).
(4) Improper settings of switches or controls.
(5) Improper seating of bandpass or dummy filter in T–302(*)/TRC or R–417(*)/TRC.
(6) Improper seating of transmitter tuning head in T–302(*)/TRC.
(7) Improper seating of receiver tuning head in R–417(*)/TRC.
(8) Loose or poor ground connections.
(9) Ground Rod MX–148/G not imbedded in moist ground.

*b.* If the above checks do not locate the trouble, refer to the operator's troubleshooting checklists (par. 66).

## 66. Operator's Troubleshooting Checklists

*a. General.* The troubleshooting checklists will help the operator correct abnormal conditions encountered during the starting procedures (ch. 4), lineup procedures (pars. 48–51), and operating procedures (pars. 54 and 55). Only those corrective measures that the operator can accomplish are given. If the corrective measures given do not restore normal equipment performance, troubleshooting by

| ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS | CONDITION |
|---|---|
| 26. ~~INSPECT ANTENNA FOR ECCENTRICITIES, CORROSION, LOOSE FIT, DAMAGED INSULATORS AND REFLECTORS.~~ | |
| 27. ~~CHECK FOR NORMAL OPERATION.~~ | |
| 28. ~~BEFORE SHIPPING OR STORING, REMOVE BATTERIES~~ | |

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION.

ITEM 7. FRAYED CABLE ASSEMBLY CX-2253/U BETWEEN PP-685/U AND T-302/TRC. REPORTED TO HIGHER ECHELON FOR REPLACEMENT.

FOLD

## MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
SOUND EQUIPMENT, RADIO, DIRECTION FINDING
RADAR, CARRIER, RADIOSONDE AND TELEVISION
*(AR 750-625)*

EQUIPMENT NOMENCLATURE: RADIO SET AN/TRC-24

EQUIPMENT SERIAL NUMBER: 130

### INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon:
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

TYPE OF INSPECTION

| OPERATOR | 2/3 ECHELON | DATE | SIGNATURE |
|---|---|---|---|
| ✓ | | 16 JULY 1960 | Charles W. Brown |
| | | | |
| | | | |
| | | | |
| | | | |

DA, FORM 1 MAY 57 11-238

REPLACES DA FORMS 11-238, 1 NOV 55; 11-239, 11-244, 11-245, 11-248, 11-249, 11-250, AND 11-251; WHICH ARE OBSOLETE

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*Figure 34. DA Form 11-238 (pages 1 and 4).*

LEGEND for marking conditions:
Satisfactory, ✓.
Adjustment, Repair or Replacement required, X.
Defect corrected, (X).

DAILY CONDITION FOR MONTH OF JULY 1960

| NO. | DAILY ITEM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 2D 3D ECHELON |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CB 17 | CB 18 | CB 19 | CB 20 | CB 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | |
| 1. | COMPLETENESS AND GENERAL CONDITION OF EQUIPMENT. *(Transmitter, receiver, carrying cases, wire, cables, ~~microphones, tubes,~~ spare parts, technical manuals).* | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| 2. | CLEAN DIRT AND MOISTURE FROM ANTENNA, ~~MICROPHONES, HEADSETS, KEYS,~~ JACKS, PLUGS, COMPONENT PANELS. PARA 64 | ✓ | ✓ | ✓ | (X) | ✓ | | | | | | | | | | | | |
| 3. | INSPECT CONTROLS FOR NORMAL OPERATION. TAP CONTROLS LIGHTLY FOR EVIDENCE OF CUT-OUT FROM LOOSE CONTACTS. PARA 64 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| 4. | CHECK FOR NORMAL OPERATION OF EQUIPMENT. BE ALERT FOR UNUSUAL OPERATION OR CONDITION. PARA 54 | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | | | | | | | | |

| WEEKLY | CONDITION EACH WEEK 1ST | 2D | 3D | 4TH | 5TH | 2D 3D ECH |
|---|---|---|---|---|---|---|
| 5. CLEAN AND TIGHTEN EXTERIORS OF CASES, RACKS, MOUNTS, TRANSMISSION LINES. | ✓ | | | | | |
| 6. INSPECT CASES, MOUNTS, ANTENNA TOWERS AND EXPOSED METAL SURFACES FOR RUST, CORROSION. | ✓ | | | | | |
| 7. INSPECT CORDS, CABLE, WIRE, SHOCK MOUNTS FOR CUTS, KINKS, BREAKS, FRAYING, UNDUE STRAIN. PARA 64 | X | | | | | |
| 8. CHECK ANTENNA GUY WIRES FOR PROPER TENSION OR DAMAGE. PARA 64 | ✓ | | | | | |
| 9. INSPECT CANVAS AND LEATHER ITEMS FOR MILDEW, TEARS, FRAYING. | ✓ | | | | | |
| 10. INSPECT ACCESSIBLE ITEMS FOR LOOSENESS: SWITCHES, KNOBS, JACKS, CONNECTORS, ~~RELAYS, TRANSFORMERS, MOTORS,~~ PILOT LIGHTS, ~~BLOWERS,~~ ETC. | ✓ | | | | | |
| 11. CLEAN AND/OR INSPECT AIR FILTERS, BRASS NAME PLATES, DIAL AND METER WINDOWS. | ✓ | | | | | |
| 12. ~~INSPECT STORAGE BATTERIES FOR DIRT, LOOSE TERMINALS, SPECIFIC GRAVITY, DAMAGED CASES, INSPECT DRY BATTERIES FOR LEAKAGE.~~ | | | | | | |

| ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS | CONDITION |
|---|---|
| 13. ~~INSPECT SHELTERS AND COVERS FOR ADEQUACY OF WEATHER PROOFING, TEARS, FRAYING.~~ | |
| 14. ~~CHECK TERMINAL BOX COVERS FOR CRACKS, DIRT, LEAKS, DAMAGED GASKETS, GREASE.~~ | |

| ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS | CONDITION |
|---|---|
| 15. ~~INSPECT SEATING OF READILY ACCESSIBLE PLUG-OUT ITEMS, TUBES, LAMPS, FUSES, CRYSTALS, CONNECTORS, VIBRATORS, PLUG-IN COILS.~~ | |
| 16. ~~INSPECT RELAYS AND CIRCUIT BREAKERS FOR LOOSE MOUNTINGS, BAD CONTACTS, MIS-ALINEMENT OF CONTACTS AND SPRINGS, PROPER SPRING TENSION.~~ | |
| 17. ~~INSPECT VARIABLE CAPACITORS FOR DIRT, MIS-ALINEMENT OF PLATES, LOOSE MOUNTINGS, MOISTURE.~~ | |
| 18. ~~INSPECT RESISTORS, BUSHINGS AND INSULATORS FOR CRACKS, CHIPPING, BLISTERING, MOISTURE, DISCOLORATION.~~ | |
| 19. ~~CLEAN AND TIGHTEN SWITCHES, TERMINAL BLOCKS, BLOWERS, RELAY CASES AND INTERIORS OF CHASSIS AND CABINETS NOT READILY ACCESSIBLE.~~ | |
| 20. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~ | |
| 21. ~~INSPECT TERMINALS OF LARGE FIXED CAPACITORS AND RESISTORS FOR DIRT, CORROSION, LOOSE CONTACTS.~~ | |
| 22. ~~INSPECT TRANSFORMERS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR OVERHEATING AND OIL LEAKAGE.~~ | |
| 23. ~~INSPECT GENERATORS, AMPLIDYNES, DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND FITTING OF COMMUTATOR.~~ | |
| 24. ~~INSPECT CATHODE RAY TUBES FOR BURNT SCREEN SPOTS.~~ | |
| 25. ~~INSPECT WATERPROOF GASKETS FOR LEAKS, WORN OR LOOSE PARTS.~~ | |

CONTINUED ON PAGE 4



☆ GPO: 1957 O—427034

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*Figure 35. DA Form 11-238 (pages 2 and 3).*

higher echelon maintenance personnel is required. Note on a repair tag how the equipment performed at the time of failure and the corrective measure taken.

*b. Power Equipment Checklist.*

| Item No. | Symptom | Probable cause | Correction |
|---|---|---|---|
| 1 | AC VOLTS meter (fig. 23) indicates zero and FIL indicator does not illuminate. | Defective PU–286/U | Refer to TM 11–940A. |
| | | Defective fuses in TF–167/TRC (A, fig. 24) or J–532/U (fig. 2). | Replace defective fuses (par. 67*b*). |
| | | Loose or improperly seated connectors on 115V AC INPUT connector (fig. 23), 115–230V connector (A, fig. 24), or connectors on J–532/U (fig. 2). | Check seating of connectors. |
| | | Damaged interconnecting cables or defective 115V AC circuit breaker. | Higher echelon maintenance required. |
| 2 | AC VOLTS meter indicates zero and FIL indicator illuminates. | Defective AC VOLTS meter | Higher echelon maintenance required. |
| 3 | AC VOLTS meter indicates correct voltage and FIL indicator does not illuminate. | Defective lamp in FIL indicator | Replace lamp in FIL indicator (par. 67*a*). |
| 4 | With DC TEST switch in 150 UPPER SCALE: | | |
| | DC VOLTS meter indicates zero and 150V DC indicator does not illuminate. | Defective 150V DC circuit breaker | Higher echelon maintenance required. |
| | DC VOLTS meter indicates zero and 150V DC indicator illuminates. | Defective DC VOLTS meter or DC VOLTS meter circuit. | Higher echelon maintenance required. |
| | DC VOLTS meter indicates correct voltage and 150V DC indicator does not illuminate. | Defective lamp in 150V DC indicator | Replace lamp in 150V DC indicator (par. 67*a*). |
| 5 | With DC TEST switch in 750 LOWER SCALE: | | |
| | DC VOLTS meter indicates zero and 750V DC indicator does not illuminate. | Defective 750V DC circuit breaker | Higher echelon maintenance required. |
| | DC VOLTS meter indicates zero and 750V DC indicator illuminates. | Defective DC VOLTS meter | Higher echelon maintenance required. |
| | DC VOLTS meter indicates correct voltage and 750V DC indicator does not illuminate. | Defective lamp in 750V DC indicator | Replace lamp in 750V DC indicator (par. 67*a*). |
| 6 | With DC TEST switch in 275 LOWER SCALE, DC VOLTS meter indicates zero. | Defective DC VOLTS meter circuit | Higher echelon maintenance required. |

*c. Transmitter Checklist.*

| | | | |
|---|---|---|---|
| 1 | No indication on MEASURE meter (fig. 21) for any setting of MEASURE switch. | Loose or improperly seated connector on POWER SUPPLY connector (fig. 21) or TRANSMITTER connector (fig. 23). | Check seating of connectors. |
| | | Damaged interconnecting cable or defective MEASURE meter (fig. 21). | Higher echelon maintenance required. |
| 2 | FREQ DRIFT meter cannot be adjusted for correct indication with DISCR CENTER control. | Defective FREQ DRIFT meter or FREQ DRIFT meter circuit. | Higher echelon maintenance required. |
| 3 | MEASURE meter cannot be adjusted for correct indication for various positions of MEASURE switch. | Defective circuits | Higher echelon maintenance required. |

| Item No. | Symptom | Probabl cause | Correction |
|---|---|---|---|
| 4 | No indication on TEST meter for any setting of TEST switch. | Defective TEST meter | Higher echelon maintenance required. |
| 5 | TEST meter cannot be adjusted for correct indication when DRIVER TUNE or DRIVER OUTPUT COUPLING controls are adjusted. | Defective circuits in transmitter | Higher echelon maintenance required. |
| 6 | TEST meter cannot be adjusted for correct indication when controls of transmitter tuning head are adjusted. | Transmitter tuning head not seated properly in transmitter. | Check seating of transmitter tuning head. |
| 7 | ME–82/U cannot be adjusted for correct indication when controls of transmitter tuning head are adjusted. | Bandpass filter or dummy filter not seated properly in transmitter. | Check seating of bandpass filter or dummy filter. |
| | | Loose or improperly seated connector on ANTENNA jack or ME–82/U. | Check seating of connectors. |
| | | Defective ME–82/U | Replace ME–82/U. |
| | | Defective CG–718/U between ANTENNA jack and ME–82/U | Replace CG–718/U. |
| 8 | LOW POWER ALARM indicator will not illuminate under any condition. | Defective lamp in LOW PWR ALARM indicator. | Replace lamp in LOW PWR ALARM indicator (par. 67*a*). |
| 9 | Buzzer will not sound under any condition. | Defective buzzer or transmitter circuit | Higher echelon maintenance required. |
| 10 | DRIVER OUTPUT COUPLING control cannot be adjusted for a 35 ±1 microampere indication on the TEST meter with the TEST switch in PWR AMPL GRID position when using the A-band transmitter tuning head. | INPUT LOADING adjustment of AM–1180/GRC incorrect. | Perform input loading adjustment (par. 68*a*). |
| 11 | Rf channel number indication on plate tune dial (fig. 25) of AM–1180/GRC (A-band) incorrect. | Tracking adjustment of AM–1180/GRC incorrect. | Perform tracking adjustment (par. 68*b*). |

*d. Receiver Checklist* (fig. 21).

| | | | |
|---|---|---|---|
| 1 | POWER indicator does not illuminate when POWER switch is operated to ON. | Defective lamp in POWER indicator. | Replace lamp in POWER indicator (par. 67*a*). |
| | | Loose or improperly seated connector in AC connector. | Check seating of connector. |
| | | Damaged interconnecting cable or POWER switch. | Higher echelon maintenance required. |
| 2 | MEASURE meter and FREQ DRIFT meter cannot be adjusted for correct indications from receiver tuning head. | Receiver tuning head not seated properly in receiver. | Check seating of receiver tuning head. |
| 3 | ALARM indicator does not illuminate under any condition. | Defective lamp in ALARM indicator. | Replace lamp in ALARM indicator (par. 67*a*). |
| 4 | Buzzer does not sound under any condition. | Defective buzzer or receiver circuit | Higher echelon maintenance required. |
| 5 | Order-wire circuit does not operate | Loose or improperly seated connector in TRANSMITTER connector. | Check seating of connector. |

## 67. Repairs

Operator's repairs consist of replacement of the indicator lamps (*a* below) and front panel fuses (*b* below).

*a. Indicator Lamps.*

(1) Unscrew the jewel lens from the indicator.

(2) Unscrew the defective lamp and remove it from the socket.

(3) Screw a new lamp into the lamp socket.

(4) Screw the jewel lens into place.

*b. Front Panel Fuses.*

(1) Unscrew the fuse cap and remove the defective fuse.

(2) Insert a new fuse of the correct rating into the fuseholder, and screw in the fuse cap.

## 68. Adjustments

Operator's adjustments consist of input loading adjustments (*a* below) and tracking adjustment (*b* below) on the AM–1180/GRC (A-band).

*a. Loading Adjustments.* Perform the procedures below when the AM–1180/GRC (A-band) has not been used for at least 1 month or when the correct reading cannot be obtained on the TEST meter (fig. 21) during the starting procedures for the A-band transmitter tuning head.

(1) Perform the procedures in paragraphs 21, 23, and 24 for RF channel No. 1.

(2) Perform the procedures in paragraph 34.

(3) Perform the procedures in paragraphs 35*a* through *i*.

(4) Operate the INPUT LOADING control (fig. 25) completely counterclockwise.

(5) Adjust the DRIVER OUTPUT COUPLING (fig. 21) for a maximum indication on the TEST meter.

*Note.* If the TEST meter indication is beyond full scale, turn the INPUT LOADING control (fig. 25) clockwise and then adjust the DRIVER OUTPUT COUPLING control (fig. 21) and the DRIVER TUNE control for a maximum indication on the TEST meter.

(6) Adjust the INPUT LOADING control (fig. 25) for an indication of 35 microamperes ±1 on the TEST meter (fig. 21).

(7) Operate the TEST switch to PWR AMPL CATH.

(8) Adjust the SCREEN VOLTS ADJ. control (fig. 25) for an indication of 21 microamperes on the TEST meter (fig. 21).

(9) Adjust the DRIVER TUNE control and the DRIVER OUTPUT COUPLING control for a maximum indication on the ME–82/U.

(10) Repeat the procedures given in (6) above.

(11) Preform the stopping procedures (par. 56).

*b. Tracking Adjustments.*

(1) Perform the procedures in paragraphs 21, 23, and 24 for RF channel No. 100.

(2) Perform the procedures in paragraphs 34 and 35.

(3) Operate the PLATE TUNE control (fig. 25) until RF channel No. 100 appears under the index pointer of the plate tune dial.

(4) Adjust the TRACKING ADJ. control for a maximum indication on the ME–82/U.

(5) Perform the stopping procedures (par. 56).

# CHAPTER 7

# MATERIEL USED IN CONJUNCTION WITH RADIO EQUIPMENT SETS

## 69. Tower AB–216/U

The AB–216/U may be substituted for the mast assembly of Antenna Accessories Group OA–1398/GRC when the antennas must be installed higher than 50 feet above the ground. The height of the AB–216/U is approximately 78 feet (TM 11–5073).

## 70. Interoperation With British Wireless Set C–41.

*a. C–41 Transmitter.* When the transmitter of the C–41 is used with Receiver, Radio R–417(*)/TRC in a four-channel carrier system, no modifications are necessary. When the transmitter of the C–41 is used with the R–417(*)/TRC in a 12-channel carrier system, modifications listed in either (1) or (2) below are required.

(1) An attenuation circuit must be substituted for the deemphasis circuit of the R–417(*)/TRC.

(2) An equalizer circuit that will provide a flat 5–decibel gain must be added to the output of the R–417(*)/TRC.

*b. C–41 Receiver.* When the receiver of the C–41 is used with Transmitter, Radio T–302(*)/TRC in a four-channel carrier system, the modification listed in (1) below is required. When the receiver of the C–41 is used with the T–302(*)/TRC in a 12-channel carrier system, the modifications in (1) and (2) below are required.

(1) Special crystals corresponding to the RF channel frequencies of the T–302(*)/TRC must be installed in the receiver of the C–41.

(2) The preemphasis network in the T–302(*)/TRC must be removed.

## 71. Radio Set Group AN/TRA–25 (F-Band) (fig. 10)

The AN/TRA–25 is used to extend the frequency range of the AN/TRC–24, AN/TRC–35, AN/TRC–36, AN/GRC–78, AN/GRC–79, xnd AN/GRC–80. Information concerning the AN/TRA–25 is provided in paragraphs 4*a*, *b*, *c*, *d*, and *i;* 5*b*(11) and *c;* 16; 20; 28; 32; 39; 46; and 54 *a*, *b*, and *c*. The quantity of AN/TRA–25's required for each of the above equipments is provided in the chart below.

| Equipment | Quantity of AN/TRA–25's required |
|---|---|
| AN/TRC–24 | 1 |
| AN/TRC–35 | 2 |
| AN/TRC–36 | 3 |
| AN/GRC–78 | 1 |
| AN/GRC–79 | 2 |
| AN/GRC–80 | 3 |

# CHAPTER 8

# DEMOLITION TO PREVENT ENEMY USE

## 72. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 73 will be used to prevent further use of the equipment.

## 73. Methods of Destruction

*a.* If complete destruction of the equipment cannot be accomplished in the time available, destroy the following components in the order given.

(1) Transmitter, Radio T–302(*)/TRC.
(2) Receiver, Radio T–417(*)/TRC.
(3) Gasoline Engine Generator Set PU–286/G.
(4) Transmitter and receiver tuning heads.
(5) Antennas.
(6) Miscellaneous equipment.

(*b*) Use any of the following methods to destroy the equipment.

(1) *Smash.* Smash the controls, tubes, coils, switches, capacitors, and meters; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

(2) *Cut.* Cut the power cords and transmission cables; use axes, handaxes, or machetes.

(3) *Burn.* Burn power cords, transmission cables, and technical manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades.

(4) *Bend.* Bend panels, cases, and cabinets.

(5) *Explode.* If explosives are necessary, use firearms, grenades, or TNT.

***Warning:*** **Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.**

(6) *Dispose.* Bury or scatter the destroyed parts in slit trenches, foxholes, or throw them into streams.

# APPENDIX I

## REFERENCES

The following references are applicable for the operator of the radio set, the radio terminal set, the radio relay set, or the radio repeater set:

| | |
|---|---|
| AR 700–38 | Unsatisfactory Equipment Report (Reports Control Symbol SCGLD–247 (R2)). |
| AR 700–58 | Report of Damaged or Improper Shipment (Reports Control Symbol CSGLD–66 (Army), BuSandA 4600–6 (Navy), Reports Control Symbol 4600–3 (Marine Corps), Air Force Exempt under par. 7*c*(3), AFR 174–1). |
| DA Pam 108–1 | Index of Army Motion Pictures, Film Strips, Slides, and Phono-Recordings. |
| DA Pam 310-series | Military Publications Indexes (as applicable). |
| FM 21–5 | Military Training. |
| FM 21–6 | Techniques of Military Instruction. |
| FM 21–30 | Military Symbols. |
| SR 320–5 | Dictionary of United States Army Terms. |
| SR 320–50 | Authorized Abbreviations and Brevity Codes. |
| TB SIG 299 | Wattmeter ME–82/U. |
| TM 11–486–6 | Electrical Communications Systems Engineering, Radio. |
| TM 11–679 | Fundamentals of Carrier and Repeater. |
| TM 11–940A | Gasoline Engine Generator Sets PU–286/G and PU–286A/G. |
| TM 11–2142 | Telephone Terminal AN/TCC–3 and Telephone Terminal AN/TCC–23 |
| TM 11–2150 | Telephone Carrier Systems Using Telephone Terminal AN/TCC–7, Telephone Repeater AN/TCC–8 (AN/TCC–21). |
| | Telephone Repeater AN/TCC–11 and Telephone Test Set TS–712/TCC–11. |
| TM 11–5073 | Towers AB–216/U and AB–216A/U, Tower Section Set AB–298/U, Guy Kit MK–101/U, Accessory Kit MK–100/U and Guy Kit MK 101/U. |
| TM 11–5820–203–15 | Operation and Organizational Field and Depot Maintenance, Radio Repeater Set AM/MRC–54(V). |
| TM 11–5820–204–15 | Operator, Organizational Field and Depot Maintenance Manual, Radio Terminal Set AN/MRC–69(V). |
| TM 11–5820–263–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools Lists and Maintenance Allocation Chart for Radio Set Group OA–1387/GRC. |
| TM 11–5820–278–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier Group OA–1390/GRC. |
| TM 11–5820–279–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier GROUP OA–1392/GRC. |
| TM 11–5820–282–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier Group OA–1394/GRC. |

| | |
|---|---|
| TM 5820–287–20 | Organizational Maintenance, Radio Sets AN/TRC–24, AN/GRC–75, AN/GRC–78, and AN/GRC–81, Radio Terminal Sets AN/TRC–35, AN/GRC–76, AN/GRC–79, and AN/GRC–82, Radio Relay Set AN/TRC–36, Radio Repeater Sets AN/GRC–77, AN/GRC–80, and AN/GRC–83 and Radio Set Group AN/TRA–25. |
| TM 11–5820–293–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna-Filter Group OA–1397/GRC. |
| TM 11–5820–296–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Group OA 1398/GRC. |
| TM 11–5820–301–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Generator Set Group OA–1675/GRC. |
| TM 11–5820–302–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Group OA–1389/GRC. |
| TM 11–5820–303–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Power Accessories Group OA–1676/GRC. |
| TM 11–5820–309–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Amplifier Group OA–1396/GRC. |
| TM 11–5820–310–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Filter Group OA–1395/GRC. |
| TM 11–5820–311–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna-Filter Group OA–1391/GRC. |
| TM 11–5820–312–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Antenna Filter Group OA–1393/GRC. |
| TM 11–5820–457–12P | Operator's and Organizational Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart for Radio Set Group AN/TRA–25. |
| TM 11–5930–201–15P | Operator's, Organizational, Field and Depot Maintenance Repair Parts and Special Tools List and Maintenance Allocation Chart, Switch Box SA–331/U. |
| TM 11–6115–202–10P | Basic Issue Items List Generator Set, Gasoline Engine PU–286/G; and Power Unit PE–197 (PU–286/G). |

# APPENDIX II

# BASIC ISSUE ITEMS LIST

## Section I. INTRODUCTION

### 1. Scope

*a.* This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as *part of* the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

*b.* The columns are as follows:

(1) *Source, maintenance, and recoverability code.* Not used.

(2) *Federal stock number.* This column lists the 11-digit Federal stock number.

(3) *Designation by model.* Not used.

(4) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description on the requisition.

(5) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(6) *Expendability.* Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

(7) *Quantity authorized.* Under "Items Comprising an Operable Equipment" the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items" the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

(8) *Illustration.*

(*a*) *Figure No.* The "Figure No." column list the figure No. that illustrates the equipment.

(*b*) *Item No.* Not used.

### 2. References

See appendix I.

## SECTION II FUNCTIONAL PARTS LIST

| (1) SOURCE MAINTENANCE AND RECOVERABILITY CODE | (2) FEDERAL STOCK NUMBER | (3) DESIGNATION BY MODEL | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | (7) QUANTITY AUTHORIZED | (8) ILLUSTRATIONS FIGURE NO | (9) ILLUSTRATIONS ITEM NO |
|---|---|---|---|---|---|---|---|---|
| | | | **ITEMS COMPRISING AN OPERABLE EQUIPMENT** | | | | | |
| | | | RADIO SET AN/TRC-24; RADIO TERMINAL SET AN/TRC-35; RADIO RELAY SET AN/TRC-36; RADIO SET AN/GRC-75; RADIO TERMINAL SET AN/GRC-76; RADIO REPEATER SET AN/GRC-77; RADIO SET AN/GRC-78; RADIO TERMINAL SET AN/GRC-79; RADIO REPEATER SET AN/GRC-80; RADIO SET AN/GRC-81; RADIO TERMINAL SET AN/GRC-82; RADIO REPEATER SET AN/GRC-83 | | | | | |
| | | | AN/TRC-24 | | | | | |
| | 5820-503-1133 | | RADIO SET AN/TRC-24: | ea | NX | | | |
| | Ord thru AGC | | TECHNICAL MANUAL TM 11-5820-287- [1] | ea | X | 2 | | |
| | 5820-543-0111 | | ANTENNA-FILTER GROUP OA-1393/GRC | ea | NX | 1 | 7 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 1 | 6 | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/TRC-35 | | | | | |
| | 5820-503-2578 | | RADIO TERMINAL SET AN/TRC-35 | ea | NX | | | |
| | Ord thru AGC | | TECHNICAL MANUAL TM 11-5820-287- [1] | ea | X | 2 | | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 1 | 6 | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0111 | | ANTENNA-FILTER GROUP OA-1393/GRC | ea | NX | 1 | 7 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |

| (1) SOURCE MAINTENANCE AND RECOVERABILITY CODE | (2) FEDERAL STOCK NUMBER | (3) DESIGNATION BY MODEL | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | (7) QUANTITY AUTHORIZED | (8) ILLUSTRATIONS FIGURE NO | (9) ILLUSTRATIONS ITEM NO |
|---|---|---|---|---|---|---|---|---|
| | | | AN/TRC-24,35,36; AN/GRC-75 thru 83 (continued) | | | | | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/TRC-36 | | | | | |
| | 5820-569-0031 | | RADIO RELAY SET AN/TRC-36 | ea | NX | | | |
| | Ord thru AGC | | TECHNICAL MANUAL TM 11-5820-287-[illegible] | ea | X | 2 | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 2 | 6 | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 2 | 8 | |
| | 5820-543-0111 | | ANTENNA-FILTER GROUP OA-1393/GRC | ea | NX | 1 | 7 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 2 | 1 | |
| | | | AN/GRC-75 | | | | | |
| | 5820-581-2104 | | RADIO SET AN/GRC-75 | ea | NX | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0113 | | ANTENNA-FILTER GROUP OA-1391/GRC | ea | NX | 1 | 12 | |
| | 5820-543-0114 | | AMPLIFIER GROUP OA-1390/GRC | ea | NX | 1 | 11 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-76 | | | | | |
| | 5820-557-6260 | | RADIO TERMINAL SET AN/GRC-76 | ea | NX | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0113 | | ANTENNA-FILTER GROUP OA-1391/GRC | ea | NX | 1 | 12 | |
| | 5820-543-0114 | | AMPLIFIER GROUP OA-1390/GRC | ea | NX | 1 | 11 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |

| (1) SOURCE MAINTENANCE AND RECOVERABILITY CODE | (2) FEDERAL STOCK NUMBER | (3) DESIGNATION BY MODEL | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | QUANTITY AUTHORIZED | (8) ILLUSTRATIONS FIGURE NO. | (8) ILLUSTRATIONS ITEM NO |
|---|---|---|---|---|---|---|---|---|
| | | | AN/TRC-24,35,36; AN/GRC-75 thru 83 (continued) | | | | | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-77 | | | | | |
| | 5820-557-6259 | | RADIO REPEATER SET AN/GRC-77 | ea | NX | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0113 | | ANTENNA-FILTER GROUP OA-1391/GRC | ea | NX | 1 | 12 | |
| | 5820-543-0114 | | AMPLIFIER GROUP OA-1390/GRC | ea | NX | 2 | 11 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 2 | 1 | |
| | | | AN/GRC-78 | | | | | |
| | 5820-581-2105 | | RADIO SET AN/GRC-78 | ea | NX | | | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 1 | 6 | |
| | 5820-543-0108 | | AMPLIFIER GROUP OA-1396/GRC | ea | NX | 1 | 13 | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0111 | | ANTENNA-FILTER GROUP OA-1393/GRC | ea | NX | 1 | 7 | |
| | 5820-543-0107 | | ANTENNA-FILTER GROUP OA-1397/GRC | ea | NX | 1 | 14 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-79 | | | | | |
| | 5820-693-9796 | | RADIO TERMINAL SET AN/GRC-79: | ea | NX | | | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 1 | 6 | |
| | 5820-543-0108 | | AMPLIFIER GROUP OA-1396/GRC | ea | NX | 1 | 13 | |
| | 5820-566-7915 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0111 | | ANTENNA-FILTER GROUP OA-1393/GRC | ea | NX | 1 | 7 | |
| | 5820-543-0107 | | ANTENNA-FILTER GROUP OA-1397/GRC | ea | NX | 1 | 14 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |

| (1) SOURCE MAINTENANCE, AND RECOVERABILITY CODE | (2) FEDERAL STOCK NUMBER | (3) DESIGNATION BY MODEL | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | (7) QUANTITY AUTHORIZED | (8) ILLUSTRATIONS FIGURE NO. | (8) ILLUSTRATIONS ITEM NO. |
|---|---|---|---|---|---|---|---|---|
| | | | AN/TRC-24,35,36; AN/GRC-75 thru 83 (continued) | | | | | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-80 | | | | | |
| | 5820-561-6630 | | RADIO REPEATER SET AN/GRC-80 | ea | NX | | | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 2 | 6 | |
| | 5820-543-0108 | | AMPLIFIER GROUP OA-1396/GRC | ea | NX | 2 | 13 | |
| | 5820-566-7945 | * | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0111 | | ANTENNA-FILTER GROUP OA-1393/GRC | ea | NX | 1 | 7 | |
| | 5820-543-0107 | | ANTENNA-FILTER GROUP OA-1397/GRC | ea | NX | 1 | 14 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 2 | 1 | |
| | | | AN/GRC-81 | | | | | |
| | 5820-578-5451 | | RADIO SET AN/GRC-81 | ea | NX | | | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-82 | | | | | |
| | 5820-578-5413 | | RADIO TERMINAL SET AN/GRC-82: | ea | NX | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |

| (1) SOURCE MAINTENANCE AND RECOVERABILITY CODE | (2) FEDERAL STOCK NUMBER | (3) DESIGNATION BY MODEL | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | (7) QUANTITY AUTHORIZED | (8) ILLUSTRATIONS FIGURE NO | (9) ILLUSTRATIONS ITEM NO |
|---|---|---|---|---|---|---|---|---|
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| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-83 | | | | | |
| | 5820-578-5452 | | RADIO REPEATER SET AN/GRC-83 | ea | NX | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 2 | 8 | |
| | 5820-543-1282 | | GENERATOR SET GROUP OA-1675/GRC | ea | NX | 1 | 3 | |
| | 5820-543-1283 | | POWER ACCESSORIES GROUP OA-1676/GRC | ea | NX | 1 | 2 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/TRA-25 | | | | | |
| | 5820-776-5406 | | RADIO SET GROUP AN/TRA-25 | ea | NX | 1 | 10 | |
| | | | RUNNING SPARES AND ACCESSORY ITEMS | | | | | |
| | | | RADIO SETS AN/TRC-24, AN/GRC-75, AN/GRC-78, AN/GRC-81<br>RADIO REPEATER SET AN/GRC-80 | | | | | |
| | | | NO PARTS AUTHORIZED FOR STOCKAGE AT FIRST ECHELON | | | | | |
| | | | AN/TRC-35 | | | | | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 1 | 6 | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/TRC-36 | | | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 1 | 6 | |

| (1) SOURCE MAINTENANCE AND RECOVERABILITY CODE | (2) FEDERAL STOCK NUMBER | (3) DESIGNATION BY MODEL | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | (7) QUANTITY AUTHORIZED | (8) ILLUSTRATIONS FIGURE NO | (9) ILLUSTRATIONS ITEM NO |
|---|---|---|---|---|---|---|---|---|
| | | | AN/TRC-24,35,36; AN/GRC-75 thru 83 (continued) | | | | | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-543-0111 | | ANTENNA-FILTER GROUP OA-1393/GRC | ea | NX | 1 | 7 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-76 | | | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0114 | | AMPLIFIER GROUP OA-1390/GRC | ea | NX | 1 | 11 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-77 | | | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0113 | | ANTENNA-FILTER GROUP OA-1391/GRC | ea | NX | 1 | 12 | |
| | 5820-543-0114 | | AMPLIFIER GROUP OA-1390/GRC | ea | NX | 1 | 11 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |

| (1) SOURCE MAINTENANCE AND RECOVERABILITY CODE | (2) FEDERAL STOCK NUMBER | (3) DESIGNATION BY MODEL | (4) DESCRIPTION | (5) UNIT OF ISSUE | (6) EXPENDABILITY | (7) QUANTITY AUTHORIZED | (8) ILLUSTRATIONS FIGURE NO | (9) ILLUSTRATIONS ITEM NO |
|---|---|---|---|---|---|---|---|---|
| | | | AN/TRC-24,35,36; AN/GRC-75 thru 83 (continued) | | | | | |
| | | | AN/GRC-79 | | | | | |
| | 5820-543-0112 | | AMPLIFIER GROUP OA-1392/GRC | ea | NX | 1 | 6 | |
| | 5820-543-0108 | | AMPLIFIER GROUP OA-1396/GRC | ea | NX | 1 | 13 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-82 | | | | | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |
| | | | AN/GRC-83 | | | | | |
| | 5820-566-7945 | | ANTENNA ACCESSORIES GROUP OA-1398/GRC | ea | NX | 1 | 5 | |
| | 5820-543-0115 | | ANTENNA GROUP OA-1389/GRC | ea | NX | 1 | 4 | |
| | 5820-543-0109 | | ANTENNA-FILTER GROUP OA-1395/GRC | ea | NX | 1 | 9 | |
| | 5820-543-0110 | | AMPLIFIER GROUP OA-1394/GRC | ea | NX | 1 | 8 | |
| | 5820-543-0116 | | RADIO SET GROUP OA-1387/GRC | ea | NX | 1 | 1 | |

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